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INVENTOR(S)					
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)			
Jay S. Daniel E. Paul T. James A.	WALKER TEDESCO BREITENBACH JORASCH	Ridgefield, CT Huntington, CT Wilton, CT Stamford, CT			
<input checked="" type="checkbox"/> Additional inventors are being named on the <u>2nd</u> separately numbered sheets attached hereto					
TITLE OF THE INVENTION (280 characters max) APPARATUS, SYSTEM AND METHOD FOR GAME-THEMED VENDING MACHINE PROMOTIONS					
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Respectfully submitted,

SIGNATURE

TYPED or PRINTED NAME D. P. Aldrucci

TELEPHONE

203.461.7337

Date

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INVENTOR(S)/APPLICANT(S)

Given Name (first and middle [if any])

Family or Surname

Residence
(City and either State or Foreign Country)

Maximillian V.
Robert C.
Geoffrey M.

**GARCIA
TEDESCO
GELMAN**

New Haven, CT
Huntington, CT
Stamford, CT

Number 2 of 2

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APPARATUS, SYSTEM AND METHOD FOR GAME-THEMED VENDING MACHINE PROMOTIONS

Provisional Patent Application

BACKGROUND INFORMATION

Previous attempts at linking games to vending machines have been unsuccessful at market for a variety of reasons. For example, games requiring a great deal of customer interaction may take a long time to play. Such games may lead to the formation of lengthy lines, aggravating potential customers, in turn having a potentially negative effect on vending machine profits.

Additionally, some customers have resisted previous attempts by operators to dynamically change vending machine prices and/or promotions in a substantially continuous manner (e.g. after each transaction), as such customers feel they may be at risk for receiving less-than-favorable treatment (e.g. offered higher prices than other customers).

Accordingly, a need exists for entertaining vending machine customers without unnecessarily complicating and/or lengthening transactions, as well as for systems and methods that present dynamically changing prices and promotions in a manner more palatable to consumers.

ABSTRACT

Systems and methods are disclosed for providing entertaining game-themed content (e.g. during vending machine transactions) for the purpose of offering one or more benefits (e.g. products, entertainment, lower prices, coupons, etc.) to a vending machine customer. In some embodiments, a vending machine control system may access data associated with one or more vending machine products (e.g. sales and inventory statistics), analyze the data in light of stored profit management rules (e.g. indicative of a profit goal), and consequently determine one or more benefits to be offered to a customer. A benefit may be communicated to a customer through a game-themed presentation output via a vending machine output device (e.g. an LCD screen).

In this manner, in addition to providing customers with an easily understood metaphor for communicating the dynamically changing prices and/or promotions of a vending machine, game-themed presentations may enhance the transaction experience by entertaining customers. Additionally, vending machines that successfully administer such profit management logic and entertain customers may benefit from increased profits and overall consumer loyalty.

DEFINITIONS USED HEREIN

Actual Velocity, Actual Sales Rate – The rate at which a given product is sold by a vending machine during a sales period (e.g. 2.5 units per day).

Benefit, Prize – An entitlement offered to a customer in accordance with a profit management rule constructed with the intent of increasing the profitability of a particular transaction or overall vending machine expected profitability (e.g. by offering certain products or promotions, profit may be increased). In some embodiments, a vending machine may present at least one *benefit offer* to a customer during a vending machine transaction, which may present the customer with an opportunity to accept and/or redeem one or more benefits. In some embodiments, a benefit may be categorized as either a *product benefit* or a *general benefit*.

- A *product benefit* may comprise (i) a specific product that a customer may select, and/or (ii) an inventory group from which a customer may select one or more products (e.g. during a vending machine transaction).
- A *general benefit* may comprise one or more of the following: (i) a discount or “promotional price” for one or more products (or a group thereof), (ii) a refund of the purchase price (or portion thereof) of one or more previously selected products, (iii) a dynamically priced upsell, (iv) a fixed price upsell, (v) free or discounted alternate, non-food products (e.g. a phone card not typically sold during routine machine transactions), (vi) a sweepstakes or contest entry, (vii) a free or discounted vending machine subscription or membership, (viii) an opportunity to procure additional benefits (e.g. a “free spin” of a “prize wheel” game-themed presentation), (ix) one or more additional product benefits (e.g. “bonus” products), and/or (x) any other entitlements.

Accordingly, in some embodiments, the prices and/or promotions of a vending machine may be dynamically constructed in a manner favorable to both consumers (who receive benefits as the result of entertaining game-themed presentations) and vending machine operators (who may experience increased profits).

Dilution, Price Dilution – The negative effect on profitability that may ensue when a product is sold for a price lower than a given customer otherwise would have paid for the product. In some embodiments, the potential for dilution is factored into stored profit management rules for determining benefit offers. Thus, in some embodiments, vending machines may be programmed to eliminate or reduce the effects of dilution by picking those benefit offers (e.g. products) that are less likely to result in dilution, or are more likely to result in less dilution.

Diversion – The negative effect on profitability that ensues when a lower price or lower profit item is sold to a customer instead of a higher price or higher profit product that the customer otherwise may have purchased. In some embodiments, the potential for diversion is factored into stored rules for constructing benefit offers. Thus, in some embodiments, vending machines may be programmed to eliminate or reduce the effects of diversion by picking those benefit offers that are less likely to result in diversion.

Dynamically Priced Upsell, Dynamic Upsell, Spare-Change Upsell, “Round-Up” Offer – An offer to a customer of a first product for the purchase of an additional product in exchange for an additional amount that is equal to an amount of change due back to the customer as a result of the customer’s purchase of the first product.

Expected Profitability – An anticipated profit amount associated with (i) a particular vending machine transaction, and/or (ii) a particular vending machine sales period (e.g. fill period). In some embodiments, calculating the expected profitability of one or more vending machine transactions involves a probability measure, which may estimate the likelihood that a vending machine may sell one or more product units over a period of time given, for example, one or more particular prices. In some embodiments, a probability measure may be estimated based on historic sales data. For example, if 20 days into a 30-day vending machine fill period, Snickers® has sold at an actual velocity of 1.5 units per day, it may be considered probable that Snickers® will continue to sell at the same velocity for the remainder of the fill period (10 days). Thus, if the margin of Snickers® is \$.20, a vending machine operator might expect that Snickers® sales would

generate an additional \$3.00 in profit before the fill period is over (1.5 units • 10 days • \$.20).

Fill Period, Sales Period – The period of time between restock dates.

Fixed Price Upsell Offer, Fixed Price Upsell – An offer to a customer of a first product for the purchase of an additional product in exchange for an additional amount that is not necessarily correlated with an amount of change due back to the customer as a result of the customer's purchase of the first product. In some embodiments, a customer who has purchased a first product and is thereby due change may be required to deposit additional currency in order to accept a fixed price upsell offer. Thus, the fixed price upsell offer may require that the customer pay an amount equal to his or her change due plus an additional amount of currency.

Full Price, Retail Price – The price conventionally charged by a vending machine operator for the purchase of a given product. In some embodiments, benefit offers may present customers with the opportunity to purchase items at less than full price.

Game-Themed Presentation, Game-Theme Data, Game-Themed Content – In some embodiments, a presentation outputted to a customer via a vending machine output device (e.g. a touch-screen LCD, LED display, etc.). Game-themed presentations may be outputted for several purposes, including but not limited to (i) entertaining a customer, and/or (ii) offering a benefit to a customer (e.g. a game result is “You won a free Snickers® Bar”).

Game Result, Game Outcome – In various embodiments, a game-themed presentation may conclude (e.g. an animation sequence ends) by outputting a game result to a vending machine customer (e.g. via an input/output device). For example, as a “prize wheel” animation concludes (e.g. the wheel stops spinning), a determined benefit is presented to a customer (e.g. the wheel stops on “Pick any blinking green item!”). In some embodiments, a game result may comprise (i) at least one benefit offer, (ii) one or more

benefit offers from which a customer may select at least one benefit, (iii) a marketing message (e.g. “Play again tomorrow!”), and/or (iv) any combination of the above. In some embodiments, a game result may be determined before a game-themed presentation is outputted. In other embodiments, a customer may influence a game result (e.g. by pressing a “stop” button during a “prize wheel” game). In further embodiments, a game result may be determined before game-theme data is outputted, though a customer may have a perceived influence over a game result. In still further embodiments, a game result may be determined by a combination of skill (i.e. player influence) and profit management rules.

Ideal Product Velocity, Target Product Velocity, Target Velocity, Target Sales Rate –

The desired rate at which a given product should be sold by a vending machine during a sales period. Thus, in some embodiments, an ideal velocity may be set or calculated for each product indicating the rate at which products must be sold in order to deplete the inventory to a certain level by the end of a given sales period (i.e. by the restock time). For example, an ideal product velocity may be calculated by a vending machine control system after an operator inputs a restock date and a desired remaining inventory for the date (e.g. an operator may wish to have only 1 of each item remaining at the restock date so that the machine sells as many items as possible without completely selling out and thereby disappointing customers). Thus, if an operator (a) stocks 50 units of Soda A, (b) inputs a restock date 14 days away, and (c) indicates that only one unit of Soda A should remain at the restock date, the control system may divide 49 by 14 to conclude that, on average, 3.5 units must be sold per day within the sales period in order to realize the ideal product velocity. As discussed herein, a vending machine control system may periodically, substantially continuously, or otherwise determine whether or not actual item velocity is at least equal to the ideal item velocity, and if not, may output one or more benefit offers as discussed herein. An ideal product velocity may be further set so that if such a velocity is reached, the increase in volume will sufficiently offset any discounts afforded to customers through promotions or the provision of one or more benefits.

Operator – The owner (or agent thereof) of a vending machine.

Package Deal, Package Offer, Combo Deal, 2-for-1 Package, 2-for-1 Deal – An offer enabling a customer to purchase (e.g. during one vending machine transaction) at least two products for a single price (i.e. “package price”). Typically, package offers are configured to result in a net-savings to the customer when compared to the sum of the individual component products’ retail prices. In some embodiments, a package deal comprising at least two component products may include at least one *first component product* (e.g. the first product selected by a customer of a “2-for-\$1” machine) and at least one *additional component product* (e.g. the second component product provided by the machine so as to complete a package deal).

Package Deal Machine, “2-for-1” Machine, “2-for-\$1” Machine, Package Deal Vending Machine, “2-for-1” Vending Machine – In some embodiments, a “2-for-1” machine may be configured exclusively to offer package deals (e.g. customers must purchase at least two products during every transaction). In other embodiments, a “2-for-1” machine may be configured to process standard, one-item transactions as well as package deal transactions. Package deal vending machines may be characterized by appropriate, visible marketing signage (e.g. a placard reading: “2-for-\$1 Vending Machine”) so customers may understand that typical transactions exclusively involve the purchase of multiple items for a single price (Figures 7a – 7f illustrate exemplary input/output device “screenshots” of such a vending machine). Conversely, signage of a *single product vending machine* may not explicitly promote package deals (i.e. so that customers assume transactions typically involve the purchase of only one product), though such a machine may indeed be capable of processing package deal transactions.

Product, Item – A good or service sold by a vending machine. Examples of goods sold at vending machines include beverages (e.g. cans of soda) and snacks (e.g. candy bars). Examples of services sold by vending machines include car washes, photography services and access to digital content (e.g. permitting the downloading of MP3 files to a handheld device).

Product Data, General Product Data – Information associated with the inventory of vending machine. Product data may be stored in a product database, which may be updated on a periodic, substantially continuous or event-triggered basis (e.g. after every transaction) so as to reflect changes to product data. In some embodiments, product data may comprise (i) inventory quantity (e.g. n units of product x remain in the machine), (ii) cost data (e.g. the unit cost associated with one or more vending machine products), (iii) sales data (e.g. actual sales rate, ideal sales rate, etc., of one or more vending machine products), and/or (iv) fill period status (e.g. days remaining until the next restock date). In this manner, product data may be retrieved for the purpose of facilitating the profit management of a vending machine.

Profit Management, Profit Management Practice, Revenue Management, Revenue Management Practice – The practice of managing the sale and/or promotion of vending machine products so as to increase a vending machine's profitability (e.g. during a sales period). In some embodiments, a vending machine is programmed to evaluate product data in light of stored *profit management rules* indicative of a profit goal. For example, stored profit management rules may indicate an ideal product velocity (e.g. for each product of a vending machine) that would tend to increase the machine's profitability. The machine may determine that, based on current product data, the ideal product velocity (for a given product or group of products) may not be achieved based on current prices, promotions and benefit offers. In response, the vending machine may evaluate product data in light of profit management rules to identify, construct and/or offer one or more benefits to a customer (e.g. in the form of game results) with the goal of achieving the ideal product velocity (for a given product or group of products).

Restock Date, Restock Time – The time and/or date that a vending machine is scheduled to be restocked by an operator (or agent thereof) of a vending machine.

DETAILED DESCRIPTION

I. INTRODUCTION

Applicants have previously recognized ways to make vending machines more profitable by, for example, dynamically responding to market forces with variable pricing¹ and promotional offers². In some embodiments of Applicant's prior inventions, revenue management or profit management processes for changing prices and promotions are executed by vending machine processors periodically (e.g. nightly) so that all customers within a given time period (e.g. each day) are presented with the same offers. In this manner, customers are less likely to complain that previous customers within the same time period (e.g. other customers that day) were treated more favorably (e.g. offered better prices, more valuable promotions, etc.).

However, Applicants also recognize that continuous executions of such inventory management processes may be advantageous in some contexts as they permit potentially more responsive, dynamic and fluid adjustments to prices and promotions based on real-time changes in supply and demand. Accordingly, other embodiments of Applicant's prior inventions permit the substantially continuous or event-triggered (i.e. post-transaction) executions of such processes. Although many customers may understand and indeed welcome such dynamically changing promotions and prices, customers accustomed to fixed prices may resist dynamically changing prices.³ Thus, a need exists

¹ For example, Applicants' co-pending U.S. Patent Application No. 08/947798 (Attorney Docket No. 97-070) entitled METHOD AND APPARATUS FOR DYNAMICALLY MANAGING VENDING MACHINE INVENTORY PRICES, filed October 9, 1997, enables the automated, dynamic pricing of vended products based on stored rules that consider up-to-date supply and demand data gathered when no human salesperson is present (i.e. during the sales period prior to a restock date).

² For example, Applicant's co-pending U.S. Patent Application No. 10/095372 (Attorney Docket No. 02-007) entitled METHOD AND APPARATUS FOR VENDING A COMBINATION OF PRODUCTS, filed March 11, 2002, enables the automated, dynamic configuration of promotional product combinations based on supply and demand data. Further still, Applicant's co-pending U.S. Patent Application No. 09/218085 (Attorney Docket No. 98-038) entitled METHOD AND APPARATUS FOR VENDING PRODUCTS, filed December 22, 1998, enables the automatic selection of products for customers based on supply and demand data. Additionally, Applicant's co-pending U.S. Patent Application No. 09/345092 (Attorney Docket No. 98-119), entitled VENDING MACHINE SYSTEM AND METHOD FOR ENCOURAGING THE PURCHASE OF PROFITABLE ITEMS, filed June 30, 1999, enables the presentment of offers for substitute products based on supply and demand data.

³ When the Coca-Cola Company announced a variable price vending machine, the public's reaction was less than ideal. Some critics perceived such practices as "unfair" and "exploitive." See Constance L. Hayes,

for systems and methods that make such dynamic executions of revenue management processes more palatable to customers who may resist dynamically changing prices and promotions.

Further, a need exists to make vending machines more entertaining.⁴ There have been some previous attempts at linking games to vending machines, but these are unsuccessful at market for a variety of reasons. First, games requiring a great deal of customer interaction may take a long time to play.⁵ Such games may lead to the formation of lengthy lines, aggravating potential customers, in turn having a potentially negative effect on vending machine profits. Accordingly, a need exists for entertaining vending machine customers without unnecessarily complicating and/or lengthening transactions.

Generally, a vending machine in accordance with the present invention can include a device configured to manage sales transactions with customers by, among other things, receiving payment from customers, controlling the pricing and/or distribution of goods and/or controlling entitlements to services.

II. VENDING MACHINE APPARATUS AND SYSTEM ARCHITECTURE

a. Machine Casing and Cabinetry

In some embodiments, suitable machine cabinetry may be constructed from any combination of (1) commercial grade sixteen-gauge steel (e.g. for exterior panels and internal shelving), (2) transparent materials such as glass or Plexiglas (e.g. for item display windows), (3) rubber (e.g. for waterproofing insulation), (4) plastic, (5) aluminum, and/or (6) any suitable material.

Many commercially available machine casings can be modified to work in

Coke Tests Vending Unit That Can Hike Prices in Hot Weather, THE NEW YORK TIMES, Oct. 28, 1999; see also *Coke's Automatic Price Gouging*, THE SAN FRANCISCO CHRONICLE, Oct. 29, 1999.

⁴ See posting of one "sdm" to http://www.halfbakery.com/idea/Vending_20Machine_20Performance_20Art (Sept. 18, 2001) (copy on file with Applicant) (opining that vending machines provide "just a minimum standard of service. The least they could do is provide some momentary entertainment as the product is distributed.").

⁵ See posting of one "Andrew" to: <http://forums.gamespot.com/gamespot/board/message> (Oct. 23, 2002) (copy on file with Applicant) (Describing a "Catch-a-Coke" vending machine game and reporting that "Coke discontinued the machines after ... receiving a lot of complaints about long lines forming while people waited for the player to finish the game and buy their drink.").

accordance with the present invention. For example, in snack machine embodiments, a suitable machine casing may comprise the 129 SnackShop manufactured by Automatic Products International, Ltd. of Saint Paul, Minnesota, which stands at 72" / 1829 mm wide, has a width of 38 7/8" / 988 mm, and a depth of 35" / 889 mm. Other suitable snack machine casings include the A La Carte® machine from Automatic Products, and the GPL SnackVendor model # 159 from Crane Merchandising Systems/ Crane Co. of Stamford, Connecticut.

In beverage machine embodiments, machine casings commercially available from Dixie Narco, Inc. of Williston, South Carolina may be employed. Beverage machine casings may comprise a "cooler" or "glass front" style front panel, featuring a transparent front panel (e.g. glass) enabling customers to see inventory for sale. Alternatively, beverage machine casings may comprise a "bubble front" style front panel, featuring a decorative front panel, typically used to advertise a logo of a product manufacturer commercially interested in the vending machine's operation.

Other embodiments are contemplated as well, including combination snack and beverage vending machine embodiments, such as those available from Crain Co. Further details concerning the suitability of machine casing/cabinetry are well known in the art, and need not be described in further detail herein.

b. Inventory Storage and Dispensing Mechanisms

Inventory storage and distribution functions of a vending machine configured in accordance with a snack machine embodiment of the present invention may include one or more of: (i) a drive motor, (ii) metal shelves, (iii) a product delivery system (e.g. a chute, product tray, product tray door, etc.), (iv) dual spiral (i.e. double helix) item dispensing rods, (v) convertible, extendable and/or configurable rows and/or shelves, and/or (vi) a refrigeration unit. In embodiments using the casing of the model 129 SnackShop manufactured by Automatic Products, 3 removable shelves may be employed, together providing for 30 product rows and an inventory capacity of between 185 to 522 commonly vended snack products.

Inventory storage and distribution functions of a vending machine configured in accordance with a beverage machine embodiment of the present invention may include

one or more of: (i) metal and/or plastic shelving, (ii) item dispensing actuators/motors, (iii) product delivery chutes, and/or (iv) a refrigeration unit.

Further details concerning vending machine inventory storage and dispensing mechanisms are well known in the art, and need not be described in further detail herein.

c. Payment Processing Mechanisms

The vending machine may also include one or more mechanisms for receiving payment and dispensing change, including a coin acceptor, a bill validator, a card reader (e.g. a magnetic stripe reader) and a change dispenser.

In a manner known in the art, a magnetic stripe card reader may read data on the magnetic stripe of a credit or debit card, and it may cooperate with conventional point-of-sale credit card processing equipment to validate card-based purchases through a conventional transaction authorization network. Suitable card-based transaction processing systems and methods are available from USA Technologies, Inc.

The coin acceptor, bill validator and change dispenser may communicate with a currency storage apparatus (a “hopper”) and may comprise conventional devices such as models AE-2400, MC5000, TRC200 by Mars, Inc. of West Chester, Pennsylvania, or CoinCo model 9300-L. The coin acceptor and bill validator may receive and validate currency that is stored by the currency storage apparatus. Further, a bill validator or coin acceptor may be capable of monitoring stored currency and maintaining a running total of the stored currency, as is discussed with reference to U.S. Patent No. 4,587,984, entitled COIN TUBE MONITOR MEANS, the entirety of which is incorporated by reference herein for all purposes. The change dispenser activates the return of coinage to the customer when appropriate (e.g. when a customer rejects or otherwise fails to accept a dynamically priced upsell offer). Such apparatus may feature Multidrop Bus (MDB) and/or Micromech peripheral capabilities, as is known in the art.

In another embodiment, a vending machine in accordance with the present invention may be configured to receive payment authorization and product selection commands through a wireless device communication network, directly or indirectly, from a customer’s wireless device (e.g. a cellular telephone). In such an embodiment, a payment processing mechanism may comprise a cellular transceiver operatively

connected to a processor, as described herein. Systems and methods allowing for the selection of and payment for vending machine articles through cellular telephones are provided by USA Technologies, Inc., of Wayne, Pennsylvania. Further, in such an embodiment, a customer cellular telephone may serve as an input/output device, as described herein.

Further details concerning vending machine payment processing mechanisms are well known in the art, and need not be described in further detail herein.

d. Input/Output Devices

In accordance with the present invention, a vending machine may include an input device for receiving input from (i) a customer indicating (a) a product and/or offer selection, (b) a customer identifier, (c) a redemption or coupon code, and/or (d) contact information (e.g. an e-mail address), and/or (ii) an operator (or agent thereof) during stocking or maintenance of the vending machine. Also, a vending machine may include one or more output devices for outputting product information, benefit offers and/or game-themed presentations to a customer or operator.

Many combinations of input and output devices may be employed in accordance with the present invention. In some embodiments, a vending machine may include more than one input device. For example, vending machine may include an exterior input device for receiving customer input and an interior input device for receiving operator input. In some embodiments, however, the input device provides the dual functionality of receiving input data from both operators and customers. Likewise, a vending machine may comprise more than one output device (e.g. an LCD screen and several LEDs, as described herein). However, in some embodiments, such as those which feature touch-screens (described herein), input and output functionality may be provided by a single device.

Many input devices are contemplated. Thus, an input device may comprise one or more of (1) a set of alpha-numeric keys for providing input to the vending machine, such as the Programmable Master Menu® Keypad, (2) a selector dial, (3) a set of buttons associated with a respective set of item dispensers, (4) a motion sensor, (5) a barcode reader, (6) a voice recognition module, (7) a Dual-Tone Multi-Frequency

receiver/decoder, (8) a wireless device (e.g. a cellular telephone or wireless Personal Digital Assistant), and/or (9) any other conventional input device commonly employed by a vending machine designer.

Likewise, many output devices are contemplated. For example, an output device (e.g. display device) may comprise a Liquid Crystal Display (LCD). Alternatively or additionally, an output device may also comprise one or more Light Emitting Diode (LED) displays (e.g. several alphanumeric LED displays on the shelves of a vending machine associated proximately with each row of product inventory).

In one embodiment, an LED display screen is mounted atop the vending machine (via bolts or other mounting hardware) and is used to communicate offers and other messages (e.g. messages related to game-themed presentations or the results thereof; for example, "Winner! Free Snickers®!") to prospective customers. A suitable LED display screen for such an embodiment may be housed in an aluminum case having a length of 27.5", a height of 4.25", and a depth of 1.75". Such a display screen may have a display area capable of showing 13 alphanumeric and/or graphical characters. Further, such an LED display screen may comprise a serial computer interface, such as an RJ45/RS232 connector, for communicating with a processor, as described herein. Further still, such an LED display may be capable of outputting text and graphics in several colors (e.g. red, yellow, green, black) regarding current and upcoming promotions.

Further, in some embodiments, an output device comprises a printer. In one embodiment, a printer is configured to print on card stock paper (e.g. 0.06mm to 0.15mm thickness), such as the EPSON EU-T400 Series Kiosk Printer. Further, a printer may be capable of thermal line printing of various alphanumeric characters and graphical symbols (e.g. bar codes) in various font sizes (e.g. ranging from 9 to 24 point) on various types of paper. Additionally, such a printer may communicate with a processor (described herein) via an RS232 / IEEE 12834 and/or bi-directional parallel connection. Such a printer may further comprise a 4KB data buffer.

Additionally, in some embodiments, an output device comprises an audio module, such as an audio speaker, that outputs information to customers audibly.

Still further, in some embodiments, an output device may comprise a physical game-themed device, such as a spinning "prize wheel" similar to those featured on the

television game show “Wheel of Fortune™” or “The Price is Right™”, a roulette wheel, mechanical slot machine reels, or the like.

As stated, in some embodiments, a touch-sensitive screen may be employed to perform both input and output functions. Suitable, commercially available touch screens for use in accordance with the present invention are manufactured by Elo TouchSystems, Inc., of Fremont, California, such as Elo’s AccuTouch series touch screens. Such touch screens may comprise: (i) a first (e.g. outer-most) hard-surface screen layer coated with an anti-glare finish, (ii) a second screen layer coated with a transparent-conductive coating, (iii) a third screen layer comprising a glass substrate with a uniform-conductive coating. Further, such touch screens may be configured to detect input within a determined positional accuracy, such as a standard deviation of error less than ± 0.080 -inch (2 mm). The sensitivity resolution of such touch screens may be more than 100,000 touchpoints/in² (15,500 touchpoints/cm²) for a 13-inch touch screen. For such touch screens, the touch activation force required to trigger an input signal to the processor (described herein) via the touch screen is typically 2 to 4 ounces (57 to 113 g). Additionally, touch screens for use in accordance with the present invention may be resistant to environmental stressors such as water, humidity, chemicals, electrostatic energy, and the like. These and other operational details of touch screens (e.g. drive current, signal current, capacitance, open circuit resistance, closed circuit resistance, etc.) are well known in the art and need not be described further herein.

e. Logic/Control/Processing Apparatus

The components of the vending machine, including the input device, output device, coin acceptor, bill validator, card (e.g. magnetic stripe) reader, change dispenser, currency storage apparatus, and product dispensing mechanism(s) (collectively, the “peripherals”) communicate with, and are controlled by, a control system or processor, such as one based on the Intel® Pentium® or Centrino™ series processor. The processor may be in communication with a memory and a communications port (e.g., for communicating with one or more other computers or vending machines). The memory may comprise an appropriate combination of magnetic, optical and/or semiconductor memory, and may include, for example, Random Access Memory (RAM), Read-Only

Memory (ROM), a compact disc and/or a hard disk. The memory may comprise or include any type of computer-readable medium. The processor and the memory may each be, for example: (i) located entirely within a single computer or other device; or (ii) connected to each other by a remote communication medium, such as a serial port cable, telephone line or radio frequency transceiver.

A memory may store a program for controlling a processor. The processor performs instructions of the program, and thereby operates in accordance with the present invention, and particularly in accordance with the processes described in detail herein. The program may be stored in a compressed, uncompiled and/or encrypted format. The program furthermore includes program elements that may be necessary, such as an operating system, a database management system and “device drivers” for allowing the processor to interface with the peripherals. Appropriate program elements are known to those skilled in the art, and need not be described in detail herein.

The term “computer-readable medium” as used herein refers to any medium that participates in providing instructions to a processor for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media include, for example, optical or magnetic disks, such as memory. Volatile media include dynamic random access memory (DRAM), which typically constitutes the main memory. Transmission media include coaxial cables, copper wire and fiber optics, including the wires that comprise a system bus coupled to the processor. Transmission media may carry acoustic or light waves, such as those generated during radio frequency (RF) and infrared (IR) data communications. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, any other magnetic medium, a CD-ROM, DVD, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, an EPROM, a FLASH-EEPROM, any other memory chip or cartridge, a carrier wave as described hereinafter, or any other medium from which a computer can read. Various forms of computer readable media may be involved in carrying one or more sequences of one or more instructions to a processor for execution.

According to an embodiment of the present invention, the instructions of the program may be read into a main memory from another computer-readable medium, such

as from a ROM. The execution of sequences of the instructions in a program causes the processor to perform the process steps described herein. In alternate embodiments, hard-wired circuitry may be used in place of, or in combination with, software instructions for implementation of the processes of the present invention. Thus, embodiments of the present invention are not limited to any specific combination of hardware and software.

The memory also may store one or more databases. Some or all of the data stored in each database is described herein. The described data represents exemplary information only; those skilled in the art will understand that the number, content, and form of the data can be different from that which is described herein without departing from the spirit and scope of the invention. Further, despite any description of the databases as tabular, relational databases, an object-based model could be used to store and manipulate the data types of the present invention and likewise, object methods or behaviors can be used to implement the processes of the present invention.

Thus, the machine's processing apparatus, in conjunction with the peripherals (e.g. through RS232 connections and/or other suitable connections), manages interactions with the user in accordance with stored business logic, described herein.

f. Retrofitting Conventional Vending Machines with a Separate Device

In one embodiment, one or more of the processor, the input device(s), RAM, ROM, output device(s) and a data storage device may be included, wholly or partially, in a separate device, such as the e-Port™ by USA Technologies Inc., that is in communication with a vending machine. The separate device may also be in communication with a network such as the Internet.

The e-Port™ is a credit and smart card-accepting unit that controls access to office and MDB vending equipment, and serves as a point of purchase credit card transaction device. The e-Port™ includes an LCD that allows for the display of color graphics, and a touch sensitive input device (touch screen) that allows users to input data to the device. The display may be used to prompt users interactively with, for example, offers and information about their transaction status.

The separate device may alternatively be a programmed computer running appropriate software for performing the necessary functions described herein. The

separate device may be operable to receive input from customers, receive payment from customers, exchange information with a remotely located server and/or display messages to customers (e.g. benefit offer content). The separate device may be operable to instruct the vending machine that appropriate payment has been received (e.g., via a credit card read by the separate device) and/or that a particular product should be dispensed by the vending machine. Further, a separate device may be operable to instruct the vending machine to execute game-themed promotions or price changes.

Thus, a separate device may be operatively connected to a vending machine to perform the inventive processes described herein. In this manner, conventional vending machines may be retrofitted with such separate devices so as to perform the inventive processes described herein.

g. Network Embodiments

The present invention can be configured to work in a network environment including a computer that is in communication, via a communications network, with one or more vending machines. The computer may communicate with the vending machines directly or indirectly, via a wired or wireless medium such as the Internet, LAN, WAN or Ethernet, Token Ring, or via any appropriate communications means or combination of communications means. Each of the vending machines may comprise computers, such as those based on the Intel® Pentium® processor, that are adapted to communicate with the computer. Any number and type of machines may be in communication with the computer.

Communication between the vending machines and the computer, and among the vending machines, may be direct or indirect, such as over the Internet through a Web site maintained by computer on a remote server or over an on-line data network including commercial on-line service providers, bulletin board systems and the like. In yet other embodiments, the vending machines may communicate with one another and/or the computer over RF, cable TV, satellite links and the like.

Some, but not all, possible communication networks that may comprise the network or be otherwise part of the system include: a local area network (LAN), a wide area network (WAN), the Internet, a telephone line, a cable line, a radio channel, an

optical communications line, and a satellite communications link. Possible communications protocols that may be part of the system include: Ethernet (or IEEE 802.3), SAP, ATP, Bluetooth™, and TCP/IP. Communication may be encrypted to ensure privacy and prevent fraud in any of a variety of ways well known in the art.

Those skilled in the art will understand that vending machines and/or computers in communication with each other need not be continually transmitting to each other. On the contrary, such vending machines and/or computers need only transmit to each other as necessary, and may actually refrain from exchanging data most of the time. For example, a vending machine in communication with another machine via the Internet may not transmit data to the other machine for weeks at a time.

In an embodiment, a server computer may not be necessary and/or preferred. For example, the present invention may, in one or more embodiments, be practiced on a stand-alone vending machine and/or a vending machine in communication only with one or more other vending machines. In such an embodiment, any functions described as performed by the computer or data described as stored on the computer may instead be performed by or stored on one or more vending machines.

In other embodiments, a vending machine may be in communication with a remote computer, such as a server, that provides the vending machine with and/or receives from the vending machine, e.g., all or some of the data described herein. Thus, in certain embodiments, the server may comprise certain elements or portions of certain elements such as a data storage device/ memory.

In such an embodiment, the remote computer could be accessible, directly or indirectly, via a second computer (communicating over the Internet or other network) by a customer or another operator. Accordingly, a customer or other operator of the second computer (e.g. an owner of the vending machine) could communicate with the remote computer via a Web browser. The second computer could, e.g., receive from the remote computer messages described herein as being output by the vending machine, and/or transmit to the remote computer input described herein as being provided to the vending machine. Similarly, various data described herein as received through an input device of a vending machine may be received through a Web browser communicating with a remote server, which in turn communicates with the vending machine. Thus, an

owner/operator of the vending machine may have remote polling and reporting capabilities, may be able to transmit new business rules to the vending machine, and the like.

h. General Software Architecture

In one embodiment, a software-based control system executes instructions for managing the operation of the vending machine, and in particular in accordance with the inventive functionality described herein. Such vending machine operations include, but are not limited to: (1) item pricing (e.g. displaying prices via an LED, changing such prices where appropriate, etc.), (2) processing vending transactions by (i) receiving customer selections via an input device, (ii) processing payment via a payment processing mechanism, and (iii) actuating corresponding item dispensing mechanisms, (3) configuring benefit offers, (4) outputting benefit offers to customers via output devices (including display of game-themed graphics/content on LCD and LED displays), and (5) recording transaction information (inventory levels, acceptance rates for promotions, etc.).

In some embodiments, machine peripherals (e.g. machine hardware, including mechanical hardware such as input devices, output devices, inventory dispensing mechanisms, and payment processing mechanisms including coin acceptors, bill validators, card readers, change dispensers, etc.) will be controlled by the software-based control system through a standard RS-232 serial interface. In such embodiments, embedded API/devices may be used to enable the software to actuate/control vending machine peripherals via RS-232 connectivity. Such vending machine peripherals may be operatively connected to the control system directly or indirectly, in any manner that is practicable.

As illustrated by Figure 2, in one embodiment, control software can be divided into three abstract components. Such division may provide a clear partition of tasks, which may be desirable so that any future modification and new programming can be applied without disrupting other components. Turning to Figure 2, the three abstract components are illustrated, including a Business Logic component 10, a Control Layer component 20, and an exemplary Machine Peripheral component 30. As stated earlier,

more machine peripherals may be employed. The Business Logic component 10 is connected to Control Layer component 20 via API 15; Control Layer component 20 is connected to Machine Peripheral component 30 via API 25.

Turning to Figure 2, the Business Logic component 10 visually represents the portion of the software that determines benefit offers, as discussed herein. Such a component may access a rules database and an inventory database to perform such functions. The Control Layer component 20 visually represents the portion of the software which interfaces with at least one Machine Peripheral component 30, and thereby transmits commands to perform such functions as: (i) outputting offer information via an output device (i.e. a Machine Peripheral component 30), (ii) dispensing products via a product dispensing mechanism (i.e. a Machine Peripheral component 30), (iii) dispensing change due to a customer via a payment processing mechanism, which may include a change dispenser and a currency storage apparatus (i.e. several Machine Peripheral components 30). As stated, the Machine Peripheral component 30 generally represents machine hardware, including mechanical hardware such as input devices, output devices, inventory dispensing mechanisms, and payment processing mechanisms including coin acceptors, bill validators, card readers, change dispensers, etc.

III. PROCESS STEPS

a. Introduction

Several process steps (see Figure 3) may be performed (e.g. by a vending machine control system) in accordance with various embodiments of the present invention.

In some “product entitlement” embodiments (see Figures 6a – 6b for exemplary input/output device screenshots), after a customer purchasing a package deal has selected a first component product, a customer may be entitled to select at least one additional component product. In such embodiments, product data may be accessed in light of stored profit management rules to determine and display to a customer, in conjunction with a game-themed presentation, a benefit offer comprising: (i) a particular additional component product to be provided, (ii) an inventory group from which at least one additional component product may be selected, and/or (iii) one or more general benefits that may be offered in addition to a product.

For example, if a customer approaches a “2-for-\$1” machine, deposits \$1.00 and selects a first component product (e.g. Doritos®), a vending machine control system may then (i) access product data, (ii) determine, in light of stored profit management rules and the retrieved data, to output a benefit offer comprising specific inventory group from which one additional component product may be selected, (iii) output a game-themed presentation indicating the benefit offer (e.g. on a display device, an animated “prize wheel” spins and stops on “Take any blinking green item as your second product!”), and (iv) provide the benefit (e.g. by receiving the customer’s selection of a Milky Way® bar – under which a green LED had been actuated to blink – and dispensing the bag of Doritos® and Milky Way® bar). It may be noted that the benefit to a customer of providing a product when they are already entitled to receive one may be in enabling that customer to select (i) from a wider variety of products, (ii) a product at a discount that, if sold for its retail price, would have required the customer to deposit more money. For example, in a 2-for-\$1 purchase wherein the sum of the retail prices of each product totals more than \$1.00 (i.e. the package price), the customer has been provided with a product

benefit in that they were able to obtain “better” or more expensive products than otherwise possible (i.e. if the products were sold for their retail prices).

In this manner, during vending machine transactions wherein customers are entitled to receive at least one component product of a package deal (i.e. a product benefit), process steps disclosed herein may function to (i) establish increased customer loyalty and goodwill (e.g. by entertaining customers, providing them with benefits of high perceived value and constructing package deals that typically result in net savings), and/or (ii) result in increased profits for vending machine operators (e.g. as benefit offers are determined based on profit management rules pursuant to a profit goal).

In some “bonus benefit” embodiments (see Figures 6c – 6d for exemplary input/output device screenshots), wherein customers are not necessarily entitled to receive any product benefits, product data may be accessed in light of stored profit management rules, and one or more benefits may be determined and offered to customers as the result of a game-themed presentation. For example, if a customer approaches a “single product” vending machine, inserts payment of \$1.00 and selects a Snickers® bar for \$.65, a vending machine control system may (i) access product data, (ii) determine, in light of stored profit management rules and product data, a benefit offer comprising a dynamically priced upsell, (iii) output a game-themed presentation indicating the benefit offer (e.g. a “prize wheel” spins and stops on “Take any blinking green item instead of your change!”), and/or (iv) provide or enable the benefit (e.g. by receiving the customer’s selection of a Twix® bar as an acceptance of the upsell, dispensing the Twix® and Snickers® bars).

Following is a discussion of process steps related to these (product entitlement, bonus benefit) and other embodiments of the present invention.

b. “Product entitlement” embodiments

STEP 100: RECEIVE A CUSTOMER SELECTION OF A VENDING MACHINE PRODUCT

As discussed, in some product entitlement embodiments (i.e. wherein a customer is entitled to receive an additional component product of a package deal), a customer purchasing a vending machine package deal may initially select at least one first component product. In such embodiments, a vending machine control system may receive a signal indicating the selection of a first component product via an input device. For example, a customer may enter an item’s position identifier (e.g. “A-1”) on an external keypad, or select a graphic or icon representing the product on a touch screen display. In some embodiments, payment must be received from a customer (e.g. via a vending machine bill validator or coin acceptor) before a first component item is selected. In other embodiments, payment may be received at any other stage of a vending machine transaction prior to the transaction’s completion.

In some embodiments, a customer may select only one first component product (e.g. at a “2-for-1” machine, the maximum number of component products in a package deal may be two; thus, each package deal purchase comprises one first component product and one additional component product). In other embodiments, a customer may select more than one first component product (e.g. transactions of a “3 products for \$2” machine may comprise the selection of two first component products).

In some embodiments, after a customer selects one or more first component products, a “product database” may be updated to reflect any (i) decrease in inventory (e.g. after a Snickers® bar is selected, inventory falls from 15 to 14 units), (ii) increase in actual sales rate (e.g. after a Snickers® bar is selected, the actual sales rate increases from 1.4 units/day to 1.6 units/day), and/or (iii) additional changes to product data as described elsewhere herein.

In some embodiments, product data may be updated, stored or otherwise recorded on a periodic, substantially continuous and/or event-triggered basis. Further, in various embodiments of the present invention, product data may be recorded during any stage of

vending machine transactions (e.g. after transactions are complete, on a periodic basis, etc.).

In this manner, a vending machine may receive a selection of a product (i.e. a first component product of a package deal).

STEP 200: ACCESS PRODUCT DATA

In some embodiments, product data may comprise general information relating to the products stored in a vending machine (i.e. general product data). Further, product data may comprise (i) quantity data (e.g. n units of product x remain in the machine), (ii) cost data (e.g. the unit cost associated with one or more vending machine products), (iii) sales data (e.g. the retail price, actual sales rate, ideal sales rate, etc., of one or more vending machine products), (iv) fill period data (e.g. days remaining until the next restock date) and/or (v) any other practical data.

In this manner, as described, product data may be retrieved, recorded, stored, updated and/or otherwise accessed at various different times. For example, as a vending machine is filled with products during an initial load process (e.g. performed by a route driver), certain product data may be recorded (e.g. in fields or tables of a product database). For instance, a route driver may proactively program (e.g. via an input device) the retail price, unit cost, ideal sales rate, quantity, etc. of each product he loads into a machine. Such an agent may also indicate a date and/or time at which the machine is to be restocked. Various techniques and methods of remotely (e.g. in network embodiments, a machine is programmed from a central location) and/or automatically (e.g. as RFID-tagged products are loaded, a receiver transmits product data to a control system) programming, recording, or updating product data are also contemplated within the scope of the present invention.

Further, as the products of a vending machine are sold (e.g. during a vending machine fill period), product data may be further updated on a periodic, substantially continuous, or event-triggered basis. For instance, the actual sales rate of a given product may be expressed by the following formula:

$$\text{ACTUAL SALES RATE} = \frac{\text{UNITS OF PRODUCT SOLD}}{\text{TIME (DAYS)}}$$

Thus, the actual sales rate for Snickers® may dynamically fluctuate in accordance with product sales (e.g. after each transaction in which a Snickers® bar is sold, the “actual sales rate” field of a product database is updated as a processor receives a product selection signal from an input device). For example, if one Snickers® bar is sold every day for the first four days of a vending machine fill period (the actual sales rate is 1.0/day), the actual sales rate changes if during the fifth day two Snickers® bars are sold (the actual sales rate increases to 1.2/day).

As discussed, in some embodiments, product data may be stored in a product database, maintained within a vending machine or otherwise accessible by a vending machine control system (e.g. in network embodiments, a vending machine control system may access a remotely stored product database).

A graphic representation of an exemplary product database follows:

PRODUCT DATABASE

Product	Unit Cost	Retail Price	Margin	Units in Inventory	Actual Sales Rate	Target Sales Rate	Days until Restock
Snickers®	\$\$.55	\$.75	\$.20	7	1.15/day	1.0/day	10
Milky Way®	\$.50	\$.65	\$.15	15	.75/day	1.0/day	10
Twix®	\$.60	\$.65	\$.05	21	.45/day	1.0/day	10
Dentyne®	\$.10	\$.35	\$.25	24	.30/day	1.0/day	10
Cheetos®	\$.30	\$.60	\$.30	18	.60/day	1.0/day	10
Doritos®	\$.35	\$.60	\$.25	4	1.30/day	1.0/day	10

In the above example, product data has been retrieved on the 20th day of a 30-day fill period, 30 units of each product having initially been loaded. In this manner, product data may be evaluated in light of profit management rules (as detailed further herein) so as to determine a benefit offer (e.g. product benefit) to be presented to a customer (e.g. during the next vending machine transaction). As stated, in some embodiments, data may be retrieved on an event-triggered basis (e.g. every transaction) so as to dynamically construct different benefit offers in a manner that allows for fluid, responsive changes to supply and demand. In other embodiments, data may be retrieved periodically (e.g. once per day). In this manner, product data may be retrieved so that it may be evaluated in light of stored profit management rules to determine one or more benefit offers pursuant to a profit goal.

STEP 300: DETERMINE WHETHER TO OFFER AT LEAST ONE BENEFIT BASED ON ACCESSED DATA

In some embodiments, after a vending machine customer has selected at least one first component product of a package deal and product data has been accessed, a benefit offer may be determined in light of the accessed data and stored profit management rules. In some product entitlement embodiments, wherein a customer may be entitled to receive one or more additional component products of a package deal, a benefit offer may comprise: (i) a particular additional component product to be provided, (ii) an inventory group from which at least one additional component product may be selected, and/or (iii) one or more general benefits that may be offered in addition to a product benefit.

In some product entitlement embodiments, a profit management rule may be an instruction to offer a certain product benefit, pursuant to the increase of vending machine profit (e.g. during a fill period). In some embodiments, a profit management rule may be constructed in accordance with increasing the “expected profitability” of a vending machine, which may assume (i) that certain profit management practices (e.g. outputting product benefits characterized by low costs) may generally lead to increased profits, and/or (ii) a probability that one or more given products will sell (e.g. a certain number of units, at a certain actual velocity, when offered for a certain price, etc.). In this manner, a benefit offer (e.g. an additional component product of a package deal) may be determined so as to increase or otherwise increase the profitability of a vending machine.

As described, in some embodiments, the expected profitability of a vending machine may describe the amount of profit a machine (or the individual products thereof) may potentially earn during a given period of time (e.g. fill period) and/or from a specific transaction. Generally, vending machine profit per fill period may be increased by (i) increasing the profit margin of vending machine transactions (e.g. by selling items with lower unit costs and/or higher retail prices), (ii) increasing the actual velocity of items sold (e.g. in some embodiments, profit management rules may determine that expected profitability increases if products are sold at a lesser profit margin, but with a sufficiently offsetting increase in volume), (iii) establishing, increasing, or promoting the overall customer loyalty and/or goodwill associated with one or more machines (e.g. customers who receive benefits and/or entertainment outputs may perceive machines to be valuable,

and therefore may return to machines for future transactions), and/or (iv) any other method described herein.

In this manner, in various embodiments of the present invention, expected profitability may consider one or more of: (i) the unit cost of one or more products, (ii) the retail price of one or more products, (iii) the profit margin of one or more products, (iv) the actual sales rate of one or more products, (v) the ideal sales rate of one or more products, (vi) the quantity of one or more products remaining in a machine, (vii) the amount of time (e.g. in days) left until a machine restock date, (viii) the expiration date of one or more products, (ix) the probability that one or more products will be sold (e.g. during a given unit of time), (x) the historic “acceptance rate” of one or more benefit offers (e.g. comprising one or more products), (xi) the opportunity cost and/or potential for dilution associated with a benefit offer, and/or (xii) the goodwill (or consumer loyalty) generated by distribution of one or more products via a benefit offer.

Accordingly, in light of retrieved product data and stored profit management rules, one or more benefit offers may be determined so as to increase or increase expected profitability. For example, for a particular transaction, a profit management rule may determine that expected profitability is increased by offering the product benefit characterized by the lowest unit cost; product data may then be accessed to determine which product has the lowest unit cost, and such a product may then be presented to a customer as a benefit offer (e.g. an additional component product of a package deal). One or more vending machine profit management rules may be stored in a vending machine “profit management rules database” or otherwise accessible by a vending machine control system for the purpose of making such determinations.

As stated, in some product entitlement embodiments, a benefit offer may comprise at least one particular additional component product. In such embodiments, a variety of different profit management rules may be utilized in conjunction with retrieved product data so as to select a particular product to be offered (i.e. in the interest of increasing or increasing expected profitability).

For instance, an exemplary profit management rules database for determining at least one product to be presented as a benefit offer (e.g. an additional component product of a package deal) may appear accordingly:

PROFIT MANAGEMENT RULES DATABASE

To increase expected profitability, offer the product with the:	
1.	Lowest unit cost
2.	Lowest actual velocity
3.	Lowest actual velocity as a percentage of target velocity (actual velocity / target velocity)
4.	Most units of inventory currently in stock
5.	Lowest average profit per day (margin * actual velocity)

Thus, in some product entitlement embodiments wherein a first component product has been selected, it may be beneficial to construct profit management rules assuring that the selected additional component product (i.e. satisfying a customer's entitlement and completing a package deal transaction) may be characterized by certain product data.

In some embodiments, a product (or other benefit) that satisfies the most profit management rules may be selected as a benefit offer (e.g. comprising an additional component product). In other embodiments, a product (or other benefit) that satisfies at least one particular profit management rule may be selected. In further embodiments, rules may be constructed so as to "break ties" if more than one product satisfies a particular profit management rule. For example, a rule may state, "If more than one product satisfies Rule #1, select the product that also satisfies Rule #2." It may be noted that any combination of rules referencing any of the aforementioned expected profitability considerations may trigger a benefit offer and are contemplated within the scope of the present invention.

In some embodiments, selecting an additional component product of low unit cost may increase expected profitability. For example, since in most cases revenue per transaction at 2-for-\$1 machines is constant at \$1.00, profit per fill period may be expected to increase by reducing the cost of every transaction.

In other embodiments, selecting a product that is selling at a less-than-desirable actual velocity (e.g. less than target velocity) may increase expected profitability. As stated, in some embodiments, a product may be sold for a lesser margin if a sufficiently offsetting increase in actual velocity would lead to increased overall profit (e.g. rather than sell 3 units at a margin of \$.10 each, a rule may determine to offer 20 units at a margin of \$.05 each).

In further embodiments, selecting a product with a relatively large number of units in stock may increase profitability. For example, in an embodiment wherein vending machine inventory that remains in stock at the end of a fill period earns no revenue (e.g. expires and must be disposed of at cost to an operator), a profit management rule may determine to offer the product with the most units remaining as a restock date approaches (e.g. even if the unit is sold at less than unit cost, anticipated losses may be mitigated).

In still further embodiments, selecting an additional component product that has produced relatively little profit (e.g. between the beginning of a fill period and the time product data is retrieved) may increase expected profitability. For example, if product data is retrieved after 20 days of a 30-day fill period, and the machine has sold a total of 3 Mounds® units at a profit margin of \$.15 each: (i) the total profit earned by Mounds® sales is only \$.45, and (ii) average profit per day from Mounds® is just over \$.02. Thus, if profit management rules determine to offer the product with the lowest total profit earned and/or average profit per day, Mounds® may be offered so as to increase expected profitability. Such rules may increase expected profitability in that (i) as described, the resulting sale may lead to an increase in the actual velocity of Mounds®, and/or (ii) a vending machine may recognize the opportunity to “push” (e.g. promote via benefit offers) items that otherwise contribute poorly to a vending machine’s profit.

In yet another embodiment, a profit management rule may dictate that an additional component product should be a product with a high profit margin. Ensuring that customers select such items as additional component products of package deals may reduce diversionary behavior; if products characterized by high profit margins are “pushed” in lieu of items with low profit margins, diversion may be reduced.

Thus, the exemplary product database provided above may be referenced so as to determine the benefit offer (i.e. additional component product) that increases expected profitability. For example, Dentyne®, which has the lowest unit cost (\$.10), lowest actual sales rate (.30 units/day), most inventory in stock (24 units) and lowest retail price (\$.35) would satisfy “Rule #1,” “Rule #2,” “Rule #4” and “Rule #6.” Twix®, which so far has produced an average profit per day of only \$.02, would satisfy “Rule #5.”

Further, in some embodiments, the determination of an additional component product may comprise a probability measure, which may evaluate the likelihood of selling one or more products (e.g. a certain number of units, at a given velocity, etc.) during a given period of time (e.g. fill period). In some embodiments, the expected profitability of a vending machine may be increased by selecting additional component products that (e.g. at retail price) are considered “unlikely to be sold” during routine vending machine transactions and/or selected by customers as first or additional component products of a package deal. As discussed, since products that are unlikely to sell are also unlikely to produce any revenue, they may be sold at a reduced retail price, but with a sufficiently offsetting increase in velocity, so that overall vending machine revenue is increased.

For example, in some embodiments, the probability that a product will be sold (or not be sold) may be estimated based on historic product data. For example, if product data is retrieved on the 20th day of a 30-day fill period, a product with an actual sales rate of 1.5 units/day for the first 20 days may be expected to sell at the same rate during the final 10 days.

In some embodiments, a product benefit determination may comprise an expected profitability or expected value calculation which may be used to determine an amount of profit one or more vending machine products may be expected to earn during a given time period. Thus, referencing the ongoing example, to determine the expected profitability of Cheetos® for a given period of time (e.g. one day), an expected value calculation may in one embodiment multiply the product’s profit margin by the number of units the product is likely to sell (i.e. a probability measure). In an embodiment wherein probability is estimated based on historic sales data (i.e. actual velocity), an expected value calculation for Cheetos® (“C”) may appear accordingly:

$$\text{EXPECTED VALUE PER DAY}_C = \text{MARGIN}_C \bullet \text{ACTUAL VELOCITY}_C$$

Accordingly, based on historic data, Cheetos® may be expected to earn \$.18/day in profit (\$.30 margin at an actual sales rate of .60 units/day). Thus, if product data has been retrieved on the 20th day of a 30-day fill period, the “total expected profitability” of

Cheetos® for the remainder of the fill period may be \$1.80 (Cheetos® will earn \$.18/day for 10 days). In this manner, (i) an expected value calculation may be made for each product of a vending machine, (ii) product data may then be sorted according to the result of the calculation (e.g. products are sorted from highest to lowest total expected profitability), and (iii) a product benefit may be determined based on a profit management rule (e.g. “Offer the product with the lowest total expected profitability”).

It may be noted that in some product entitlement embodiments involving 2-for-1 machines, the probability that a given product is likely to sell may refer to the likelihood that the product is selected as a first component product of a package deal. In other product entitlement embodiments, wherein 2-for-1 machines may process routine, non-package transactions in addition to offering package deals, the probability that a given product is likely to sell may refer to the probability of the product being (i) selected as a first component product of a package deal, and/or (ii) sold during a routine, non-package transaction. It may also be noted that at the beginning of a fill period, a control system may determine a product’s actual velocity to be zero (as no sales data for that period has yet been collected); accordingly, in some embodiments, a control system may access data from a prior fill period to determine actual velocity.

Additionally, the determination of a product benefit may comprise an analysis of the potential for dilution associated with the provision of one or more products (e.g. at a given price). For example, if it is determined that a product has a high probability of being sold at its retail price (e.g. has a high actual sales rate), selling the product at less than its retail price (e.g. as an additional component product of a package deal) may constitute dilution, in which case the product may not be promoted in conjunction with a benefit offer.

In other product entitlement embodiments, a benefit offer may comprise an inventory group from which at least one additional component product may be selected. For example, a customer may be presented with three products from which only one may be selected. In such embodiments, an exemplary profit management rules database may appear accordingly:

PROFIT MANAGEMENT RULES DATABASE

To increase expected profitability, offer an inventory group comprising the three products with the:	
1.	Lowest unit cost
2.	Lowest actual velocity
3.	Lowest actual velocity as a percentage of target velocity (actual velocity / target velocity)
4.	Most units of inventory currently in stock
5.	Lowest average profit per day (margin * actual velocity in fill period)
6.	Lowest retail price

Accordingly, in one 2-for-\$1 product entitlement embodiment, customers may be presented with a group of three different products (i.e. benefit offers) from which one additional component product may be selected. In this manner, customers may benefit from having a greater number of options from which to select one or more benefits, while operators may benefit by presenting inventory groups constructed in a manner such that expected profitability may be increased. For example, in an embodiment wherein expected profitability is increased by instituting “Rule #1,” the exemplary product database provided above may be sorted by unit cost:

PRODUCT DATABASE (SORTED BY UNIT COST)

Product	Unit Cost	Retail Price	Margin	Units in Inventory	Actual Sales Rate	Target Sales Rate	Days until Restock
Dentyne®	\$.10	\$.35	\$.25	24	.30/day	1.0/day	10
Cheetos®	\$.30	\$.60	\$.30	18	.60/day	1.0/day	10
Doritos®	\$.35	\$.60	\$.25	4	1.30/day	1.0/day	10
Milky Way®	\$.50	\$.65	\$.15	15	.75/day	1.0/day	10
Snickers®	\$.55	\$.75	\$.20	7	1.15/day	1.0/day	10
Twix®	\$.60	\$.65	\$.05	21	.45/day	1.0/day	10

Thus, in such an example, it may be determined that an inventory group comprising Dentyne®, Cheetos® and Doritos® may be presented to a vending machine customer pursuant to “Rule #1”; a selection of any of these three products will produce a transaction characterized by relatively low cost, thus potentially increasing overall machine expected profitability in accordance with profit management practices.

In further embodiments, rather than construct an inventory group comprising a specific number of products (e.g. three), the number of products to be presented as part of an inventory group may be variable. Exemplary profit management rules constructed to determine such inventory groups may include, but are not limited to:

PROFIT MANAGEMENT RULES DATABASE

To increase expected profitability, offer an inventory group comprising any products wherein:	
1.	Actual sales rate < target sales rate
2.	≥ 20 units in stock
3.	Unit cost \leq \$.20
4.	Actual sales rate $\leq .5$ units/day
5.	Margin \leq \$.10

In still further embodiments, an inventory group may comprise any number of products of a certain (i) type or category (e.g. “chips,” “gum,” “soda,” etc., such that additional component products may be complimentary to first component products), (ii) location within a machine (e.g. the bottom shelf), and/or (iii) subset as displayed, determined or otherwise communicated to vending machine customers in light of profit management rules. In yet further embodiments, a customer may be presented with at least two inventory groups from which a customer may select at least one product each (e.g. “Pick any item from ‘Group A’ and any item from ‘Group B’!”).

In some embodiments, additional stored rules may be used to decide whether to offer (i) a particular additional component product, or (ii) an inventory group from which one or more additional component products may be selected. For instance, in one embodiment, a profit management rule may state: “Present one or more products with low unit costs.” Accordingly, an “inventory group vs. single product rules database” may be consulted to determine whether to present “one” or “more” products (e.g. a single product benefit, or an inventory group from which one may be selected):

INVENTORY GROUP VS. SINGLE PRODUCT RULES DATABASE

If:	Then present benefit offer comprising:
Two or more products have a unit cost below \$.20	Inventory group of those products
Only one product has a unit cost below \$.20	That product

In still further product entitlement embodiments, in addition to providing one or more additional component products (e.g. so as to satisfy a product entitlement), a general benefit may also be determined and provided. For example, a product entitlement benefit offer may comprise (i) an inventory group from which one additional component product may be selected, and (ii) a coupon for a further vending machine transaction (e.g. a benefit offer is “Pick any blinking green item *and* get a third product free during your

next package purchase!”). Determinations for providing various types of general benefits (e.g. upsells, discounts, etc.) are detailed further herein (see section entitled “bonus benefit embodiments”).

Additionally, in some product entitlement embodiments wherein at least one additional component product of a package deal may be determined in accordance with product data and profit management rules, additional “restriction rules” may place limitations on the types of additional component products offered as benefits. In some embodiments, restriction rules may consider a selected first component product and/or machine inventory status. In some embodiments, if a product benefit offer is determined in light of profit management rules, the offer may then be checked against a set of restriction rules to determine if any rules are violated. In other embodiments, restriction rules may be consulted before profit management rules are considered (so as to “narrow down” a field of potential product benefits and thereby reduce computational processing). For example, an illustration of a restriction rules database may appear accordingly:

RESTRICTION RULES DATABASE

IF:	Then additional component product must:
First component product is Doritos®, Cheetos® or Lays® Potato Chips	Not be Juicy Fruit®, Dentyne® or Wrigley’s®
First component product is a “snack”	Be a “drink”
Machine has ≤ 10 total units of “chips” in stock	Not be a bag of “chips”
First component product is not a Mars™, Inc. product	Be a Mars™, Inc. product
Machine has ≥ 50 units of “gum” in stock	Be either Juicy Fruit®, Dentyne® or Wrigley’s®

In this manner, restriction rules may ensure that determinations for additional component products are not exclusively based on profit management rules, but rather may consider various marketing and promotional strategies as well.

STEP 400: OUTPUT A GAME-THEMED PRESENTATION INDICATING A DETERMINED BENEFIT

In some product entitlement embodiments, once a benefit offer is determined, it may be indicated to a vending machine customer as the result of a game-themed presentation.

In some embodiments, a game-themed presentation may be outputted to a customer via one or more vending machine output devices described herein. For example,

a presentation may comprise a game-themed animation depicted on an LCD display and sound effects emitted via audio speakers. Additionally, a game-themed presentation may incorporate various other types of machine hardware (e.g. LED price displays) or output devices, as detailed further herein.

In various product entitlement embodiments wherein a benefit offer has been determined, game-themed presentations may take one or more of several different forms so as to indicate a determined benefit offer (for an illustration of some potential product entitlement game results, see Figure 4). It may be appreciated that any means of communicating a determined benefit offer as the result of a game-themed presentation are contemplated within the scope of the present invention, such means including but not limited to (i) text, (ii) audio, (iii) graphics, photographs or other icons, and/or (iv) any combination thereof.

In some embodiments, a game-themed presentation may comprise a “prize wheel” theme. In such embodiments, once a benefit has been determined, an animated prize wheel, which may be divided into several “wheel sections,” each representing a potential game result (i.e. benefit offer), may automatically “spin” and conclude (e.g. stop spinning, so that an arrow points to a particular, predetermined game result indicating a benefit offer). In other embodiments, a prize wheel theme may comprise a roulette wheel. In some embodiments, the wheel sections of an animated roulette wheel each represent a row position identifier (e.g. “B-1”) corresponding to a vending machine product, such that a game result (e.g. as an animation concludes, a ball “lands” on a particular row position identifier) may indicate a determined benefit offer (e.g. a customer may select the Snickers® in row position “B-1”). Further, some prize wheel embodiments may comprise a theme based on the television game show “The Price is Right™” (Figures 6a – 6d illustrate exemplary input/output device screenshots of such a theme) or “Wheel of Fortune™”.

In other embodiments, a game-themed presentation may comprise a “concealed prize” theme. In such embodiments, one or more curtains, doors, or other animated objects displayed via an output device may conceal one or more benefits. In some embodiments, an animation sequence may reveal a concealed benefit offer by removing a concealing object (e.g. a door is lifted during an animation sequence). In some

embodiments, a benefit offer may be viewable before it is concealed (e.g. during a first animation sequence), and then once again revealed (e.g. during a second animation sequence). In other embodiments, a customer may be shown several benefit offers which are then concealed (e.g. an animation shows three curtains covering three different prizes), only a certain number of which are then revealed as determined benefit offers (e.g. one of the three curtains rises to show a "Pick any green item!" benefit offer). In further embodiments, a concealed benefit offer may be revealed by "flipping over," "scratching off" or otherwise animating an object as to expose an icon or text describing a benefit offer. In still further embodiments, concealing objects may be shuffled before a benefit offer is revealed (e.g. a "shell game" wherein three objects each covering a benefit offer are shown in an initial position, animated so as to "shuffle" between positions, rest and ultimately reveal one or more benefit offers). Further, some concealed prize embodiments may comprise a theme based on the television game show "Let's Make a Deal™."

In further embodiments, a game-themed presentation may comprise a "slot machine" theme. In such embodiments, a presentation (e.g. animation) may mimic the spinning reels of a slot machine in a manner such that (i) symbols displayed on the reels may be representative of benefit offers (e.g. instead of a "BAR" symbol, a "Snickers®" symbol), and (ii) game results may be indicative of at least one determined benefit offer (e.g. the reels "spin" and "stop" such that three "Snickers®" symbols land on a "payline").

In still further embodiments, a game-themed presentation may comprise a "video poker" or "Blackjack" theme. For example, an LCD screen may depict an animation sequence showing a poker hand being dealt to a customer; should the poker hand be of a certain value or higher (e.g. two pair), a benefit may be provided (e.g. a corresponding payable presents the relationship between various game outcomes and provided benefits). In an exemplary Blackjack game-themed presentation, a customer may be automatically dealt a hand of Blackjack according to standard play; the customer may be provided with a benefit if the customer's hand is of greater value than a "dealer hand" (i.e. a winning game result).

In still further embodiments, a game-themed presentation may comprise a “bingo drawing” or “lottery drawing” theme. In some bingo-themed embodiments, an output device may depict a bingo “board” bearing a plurality of “cells.” Further, each cell may correspond to a vending machine position identifier (“A-1” represents the leftmost product on the highest shelf of a vending machine). In such embodiments, wherein a drawing (e.g. animation sequence) reveals the identity of certain cells of a bingo board, one or more markers may be placed over one or more cells, indicating at least one determined benefit offer (e.g. a marker is placed on “B-3” and a customer may select the Mounds® bar in row position B-3). In other bingo-themed embodiments, wherein each cell may represent a description (e.g. text, graphic) of a benefit offer, markers may be placed (e.g. during an animated drawing sequence) on one or more cells so as to indicate one or more determined benefit offers. In some lottery embodiments, rather than compare the results of an animated drawing sequence to a bingo board, results may be compared to at least one “lottery ticket” (e.g. depicted via one or more output devices, such as a display screen or printer), so as to determine a game result (e.g. if a customer’s lottery ticket matches a certain number of drawn numbers, the customer is provided with a benefit offer). In some embodiments, a customer may be provided with at least one lottery ticket, which may comprise any combination of the following “elements”: (i) numbers, (ii) position identifiers, and/or (iii) icons or text representing potential benefit offers. In this manner, as elements are drawn (e.g. during an animated drawing sequence), they are compared to the numbers indicated by at least one provided ticket to determine a game result (e.g. benefit offer). In another embodiment involving a lottery theme, the row position identifier of a product a customer has selected (e.g. B-3) may be used as lottery number (e.g. “Lottery Number: B-3” is printed on a ticket at the end of the transaction), such that if the same position identifier is selected during a later drawing, the customer may be entitled to receive a benefit.

In this manner, as a determined benefit offer is indicated to a customer as the result of a substantially brief (e.g. not substantially interactive and/or time-consuming) game-themed presentation, the customer may benefit from (i) the entertainment and suspense generated by the presentation and (ii) the provision of a benefit (e.g. additional component product).

It may be noted that any variations or combinations of the themes, output devices and input devices described herein, as well as additional game presentation themes, are contemplated within the scope of the present invention and may be employed for the purpose of indicating a determined benefit offer via a game-themed presentation.

STEP 500: PROVIDE AT LEAST ONE BENEFIT

In some embodiments, once a determined benefit has been indicated to a player as the result of a game-themed presentation, the benefit may be provided in a manner such that no further input or action is required from a customer. For example, in an embodiment wherein a determined benefit is a particular additional component product of a package deal (e.g. a prize wheel spins and lands on “Lays® Potato Chips”), the benefit may be provided in a substantially automatic manner (e.g. one or more vending machine dispensing mechanisms may then receive a signal from a control system, and actuate so as to dispense the bag of chips, without requiring any further commands or instructions from a customer). In further embodiments, a determined benefit may comprise two or more additional component products, which may be provided in a substantially automatic manner (e.g. a vending machine dispenses a Snickers® bar, then a bag of Doritos® without any further customer input).

In other embodiments, a determined benefit may only be provided after receiving further input from a customer (e.g. via one or more input or input/output devices described herein). For example, in an embodiment wherein a determined benefit comprises an inventory group (e.g. comprising Reese’s®, Milky Way® and Mounds®) from which a customer may select one or more additional component products of a package deal, a further selection, decision, command and/or instruction may be required from a customer before a determined benefit is provided (e.g. from the aforementioned inventory group, a customer selects a Reese’s® icon displayed on a touch screen input/output device, and the candy is dispensed).

In some product entitlement embodiments, a benefit offer (e.g. product benefit) may be dispensed via a product delivery system (e.g. a delivery bin or chute) in accordance with any distribution functions or dispensing mechanisms (e.g. dual helices) described herein and/or known in the art. In other product entitlement embodiments,

wherein in addition to a product benefit, a determined benefit offer comprises a general benefit (e.g. a coupon), the general benefit may be dispensed by any output device (e.g. a printer) as detailed elsewhere herein.

As stated, in some embodiments, a customer of 2-for-\$1 machine may elect not to purchase a package deal. In such embodiments, a vending machine may not necessarily provide the corresponding benefit of a determined benefit offer. For example, a customer may (i) insert payment (e.g. of \$1.00), (ii) select a first product (e.g. with a retail price of \$.65), (iii) elect not to purchase a second product (e.g. by pressing a “no thanks” button of an input device), (iv) receive the first product, and (v) receive change due (e.g. \$.35).

In this manner, in light of profit management rules, restriction rules and product data, a benefit offer (i.e. comprising at least one product benefit which the customer is entitled to receive) may be indicated to a vending machine customer in conjunction with a game-themed presentation, and provided to the customer. It should be noted that any processes, determinations, concepts and/or rules disclosed with respect to product entitlement embodiments may be applicable to any or all other embodiments and processes disclosed elsewhere herein. The following section describes embodiments and processes wherein a vending machine customer may not necessarily be entitled to receive a product benefit during a vending machine transaction.

c. “Bonus benefit” embodiments

STEP 100: RECEIVE A CUSTOMER SELECTION OF A VENDING MACHINE PRODUCT

As stated, in some “bonus benefit” embodiments wherein vending machine customers are not necessarily entitled to receive any products (e.g. additional component products of package deal), product data may be retrieved in light of stored profit management rules, and one or more benefit offers (i.e. general benefits) may be determined and presented to customers as the result of a game-themed presentation.

For example, if a customer (i) approaches a single product vending machine, (ii) inserts payment of \$1.00 and (iii) selects a Snickers® bar for \$.65, a vending machine control system may (a) access product data, (b) determine, in light of stored profit management rules and product data, a benefit offer comprising a dynamically priced upsell, (c) output a game-themed presentation indicating the benefit offer (e.g. a “prize wheel” spins and lands on “Take any blinking green item instead of your change!”), and/or (d) provide or enable the benefit (e.g. by receiving the customer’s selection of a Twix® bar as an acceptance of the dynamically-priced upsell, and dispensing the Twix® and Snickers® bars).

Thus, in some bonus benefit embodiments, a vending machine customer may first select at least one product in a manner detailed previously (e.g. by inputting payment and pressing “A-1” on an external vending machine keypad). Additionally, as detailed previously, product data may be updated and/or recorded so as to reflect any changes associated with the selection of a product (e.g. a decrease in inventory, increase in actual sales rate, etc.).

STEP 200: ACCESS PRODUCT DATA

In some bonus benefit embodiments, product data may be accessed after a customer of a single product vending machine has first selected at least one product. In various embodiments, as described previously, product data may be recorded, updated and/or retrieved at various times; additionally, as described previously, various types of

product data may be stored in one or more vending machine databases or in any manner such that data may be otherwise accessible by a vending machine control system.

In some bonus benefit embodiments, a general benefit may comprise (i) a “bonus” product (e.g. a benefit offer to a customer of a single product vending machine, who has selected Twix® as a first product, may be: “Winner! One free Snickers® bar!”), and/or (ii) an opportunity to purchase one or more vending machine products at less than retail price (e.g. a benefit offer may be a dynamically-priced upsell, such as: “Select any blinking green item instead of your change!”).

Accordingly, in some embodiments, retrieved product data may comprise any data associated with the inventory of a vending machine as described previously herein (i.e. general product data). Various descriptions of such data and visual examples depicting hypothetical databases thereof have been provided previously (see product entitlement embodiments).

Additionally, in some embodiments, retrieved data may comprise “machine status data,” which may consider (i) aggregate machine sales data (e.g. a machine has x total units of product in stock, has made a total of y in profit during the current fill period, has sold an average of z units/day during the current fill period, etc.), (ii) the current date and time, (iii) the amount of time remaining until a restock date, (iv) the amount of coins (e.g. number of units of each denomination) stored in a vending machine currency storage device, and/or (v) any other data related generally to a specific vending machine. An exemplary depiction of a “machine status database” of one embodiment follows:

MACHINE STATUS DATABASE

Total Units Initially Stocked	Total Units Remaining	Total Profit (in fill period)	Average Profit per Day	Average Velocity (Units per Day)	Total Coins Remaining	Days Until Restock	Date/Time
180	30	\$37.50	\$1.88	7.5	\$12.70	10	Sunday, 10/04/05, 8:00 p.m.

Still further, in some embodiments (e.g. wherein a general benefit comprises a product benefit or opportunity to purchase a product at a reduced price), retrieved product data may comprise “benefit acceptance data,” which may consider the acceptance rate of

one or more previously determined and offered general benefits. In some embodiments, the acceptance rate of a previously offered (e.g. outputted as the result of a game-themed presentation) general benefit may be expressed by the following formula:

$$\text{ACCEPTANCE RATE} = \frac{\text{\# OF ACCEPTANCES}}{\text{\# OF PRESENTATIONS}}$$

For example, if a specific general benefit (e.g. a dynamically-priced upsell for a Snickers® bar) is offered as the result of 50 game-themed presentations (e.g. offered to 50 different customers during 50 separate transactions), and is “accepted” 13 times (e.g. 13 different customers chose receive a Snickers® bar instead of their change), an acceptance rate (e.g. “.26” or “26%”) may then be associated with the general benefit offer.

Further, in some embodiments, wherein a general benefit offer provides an opportunity for a customer to purchase an additional product at a discounted price, each “discount amount” associated with the provision of the product may be represented as a unique benefit offer. A discount amount may describe the difference between an amount a product was ultimately sold for (i.e. the “sale price”) and the product’s retail price. For example, if the retail price of Doritos® is \$.55, and a unit of Doritos® is sold for \$.40 as the result of a first fixed-price upsell, the first fixed-price upsell may represent a unique general benefit with a discount amount of \$.15; if a unit of Doritos® is sold for \$.50 as the result of a second fixed-price upsell, the second fixed-price upsell may represent a unique general benefit with a discount amount of \$.05. Still further, if a general benefit offer is a coupon for Twix®, a different acceptance rate may be determined for each Twix® coupon value (e.g. such that an acceptance rate for a “\$.25 off Twix®!” coupon may be 30%, whereas an acceptance rate for a more attractive “\$.50 off Twix” coupon may be 70%). Thus, an exemplary “benefit acceptance database” may comprise, but is not limited to, the following information:

BENEFIT ACCEPTANCE DATABASE

Benefit Offered	Benefit Type	Discount Amount	Presentations	Acceptances	Acceptance Rate
Snickers®	Dynamic	\$.30	50	35	70%

	Upsell				
Snickers®	Dynamic Upsell	\$.25	50	27	54%
Snickers®	Coupon	\$.10	50	4	8%
Twix®	Dynamic Upsell	\$.25	50	29	58%
Twix®	Coupon	\$.30	50	17	34%
Twix®	Fixed Upsell	\$.05	50	7	14%
Dentyne®	Fixed Upsell	\$.05	50	3	6%
Doritos®	Full refund	\$.60	50	50	100%
Cheetos®	"Free" product	\$.60	50	44	88%

In this manner, benefit acceptance data may be retrieved and analyzed in light of stored profit management rules so as to facilitate the determination of a general benefit offer (e.g. comprising a product benefit or an opportunity to purchase one or more products at a discounted price). Further, as general benefits are accepted, benefit acceptance data may be updated on a periodic or event-triggered basis (e.g. so as to reflect an increase in an acceptance rate).

In further bonus benefit embodiments, a general benefit may not comprise a product benefit or an opportunity to purchase one or more vending machine products at less than full price, but rather an opportunity to receive or purchase at a discount one or more "non-food products" or services (e.g. a product not sold during routine vending machine transactions, such as a phone card). Accordingly, in such embodiments, retrieved data may comprise "non-food product data," which may describe (i) the number of units of one or more non-food products in inventory, (ii) the acceptance rate associated with one or more non-food products, (iii) the unit cost of one or more non-food products, (iv) subsidy information pertaining to one or more non-food products (e.g. a third-party phone card manufacturer pays a premium to a vending machine operator for each phone card provided as a general benefit), (v) operator-programmed promotion instructions (e.g. during this fill period, provide every customer with a "third-party sweepstakes entry" general benefit), and/or (vi) any other data relevant to one or more non-food products.

In this manner, various types of product data (i.e. general product data, machine status data, benefit acceptance data and/or non-food product data) may be retrieved (e.g.

accessed by a vending machine control system) pursuant to the process of determining of one or more general benefit offers in light of stored profit management rules.

STEP 300: DETERMINE WHETHER TO OFFER AT LEAST ONE BENEFIT BASED ON ACCESSED DATA

In some embodiments, after a customer has selected at least one vending machine product (e.g. during a transaction of a single product vending machine), and data has been accessed, one or more general benefit offers may be determined in light of the accessed data and stored profit management rules. In some embodiments, only one type of product data may be accessed (e.g. only general product data). In other embodiments, more than one type of product data may be accessed (e.g. a vending machine control system may access a product database and a machine status database for analysis in light of stored profit management rules) so as to determine one or more general benefit offers.

In various embodiments, a general benefit may comprise one or more of: (i) a discount or “promotional price” for one or more products (or a group thereof), (ii) a refund of the cost (or portion thereof) of one or more already-selected products, (iii) a dynamically priced upsell, (iv) a fixed price upsell, (v) free or discounted alternate, non-food products (e.g. a phone card not sold during routine machine transactions), (vi) a sweepstakes or contest entry, (vii) a free or discounted vending machine subscription or membership, (viii) an opportunity to procure additional benefits (e.g. a free spin of a prize wheel game-themed presentation), (ix) one or more bonus products, and/or (x) any other entitlements whose provision may lead to an increase in expected vending machine profitability.

As stated, in some embodiments, a general benefit may comprise a bonus product. For example, after a customer of a single product vending machine has inputted payment and selected a Diet Coke®, a general benefit offer may entitle the customer to a free, additional product (e.g. the result of a game-themed presentation is “Winner! One free A&W Root Beer®!”). In such embodiments, a vending machine control system may access (i) general product data, (ii) machine status data and/or (iii) benefit acceptance data in light of one or more stored profit management rules in a manner such that one or more particular product benefits (i.e. free products) may be determined. In some embodiments, a vending machine control system may first retrieve machine status data to

determine whether or not a vending machine's "status" warrants the provision of one or more free products (e.g., the provision of one or more free products may increase expected profitability). One or more stored profit management rules may then be used to make such a determination. The following illustration of a "machine status rules database" depicts several exemplary rules of such an embodiment:

MACHINE STATUS RULES DATABASE

To increase expected profitability, offer a free product to a customer when:	
1.	Machine actual velocity > machine ideal velocity
2.	Total profit in fill period \geq \$50.00 (target profit already exceeded)
3.	There is at least one product wherein: actual velocity/ideal velocity \geq 2
4.	There is at least one product wherein: total profit in fill period \geq \$10.00 (target profit already exceeded)
5.	Transaction occurs on Sunday between 5 p.m. and 11 p.m.
6.	There are \geq 100 total units in stock AND \leq 2 days remaining in fill period

In this manner, profit management rules may be used to determine whether or not the status of one or more particular vending machines is such that the provision of a free product may increase expected profitability. It should be noted that, typically, the provision of one or more free products may increase overall machine expected profitability as a function of increased customer satisfaction, goodwill and/or loyalty (e.g. by encouraging repeat visits and future transactions). Thus, several circumstances may arise wherein a profit management rule may determine that a vending machine should offer one or more free products. As demonstrated by the above exemplary database, such rules may determine that (i) the machine has already reached a suitable profit and/or velocity threshold, as in "Rule #1" and "Rule #2," such that a machine may provide a free product yet still expect to accrue sufficient profit during a fill period, (ii) one or more specific products have reached or exceeded a target velocity, as in "Rule #3" and "Rule #4," such that one or more units of such products may be provided for free because the products have already contributed significantly toward overall machine profit, (iii) as in "Rule # 5," the time of day and/or date is such that should a free product be provided, a further transaction during a specific time period may be encouraged (e.g. by offering free products during "off-peak" or "low-traffic" hours, customers may return during such times), (iv) a vending machine may not be likely to sell one or more products by the end

of a fill period, and thus one or more products may be offered for free (e.g. if products about to expire will be thrown out anyway, provide them for free so as to increase customer satisfaction).

Accordingly, once it has been determined that one or more free products (i.e. product benefits) may be provided (e.g. to a customer of a single product vending machine), a determination may then be made, using general product data and/or benefit acceptance data and stored profit management rules, as to which specific product to provide for free. For example, as detailed previously (see: product entitlement embodiments), a profit management rule may be constructed in accordance with general product data so as to select one or more products characterized by (i) low unit cost, (ii) low profit margin, (iii) a large number of units currently in inventory, etc. Additionally, one or more profit management rules may, in light of retrieved benefit acceptance data, indicate to select one or more products characterized by a high benefit acceptance rate (e.g. Snickers® has the highest acceptance rate of all products offered for free as a general benefit), such that the benefit offer has a high likelihood of being accepted by a customer (e.g. if expected profitability may be increased by increasing customer satisfaction, select the product most likely to satisfy a customer).

In other bonus benefit embodiments, a determined benefit may comprise an opportunity to purchase one or more vending machine products at less than retail price (i.e. at a discount). For example, if a customer has selected at least one first vending machine product, a general benefit offer may comprise an opportunity to (i) purchase a second vending machine product at a discount during the same transaction (e.g. a benefit offer is a dynamically-priced upsell, such as “Pick any bag of chips instead of your change,” wherein the amount of change due is less than the retail price of any bag of chips), and/or (ii) purchase a second vending machine product at a discount during a later transaction (e.g. a benefit offer is a “\$.15 off Snickers® – Tuesday through Thursday” coupon).

In such embodiments, a vending machine control system may first analyze machine status data in light of stored profit management rules so as to determine whether or not the status of the vending machines is such that the provision of a discounted product may increase expected profitability; such a determination of machine status may

be made in a manner substantially similar to bonus product embodiments described above. Accordingly, once it has been determined that machine status is such that outputting a general benefit offer comprising an opportunity to purchase one or more vending machine products at a discount may potentially increase expected profitability, a general benefit may be determined by analyzing general product data and/or benefit acceptance data in light of additional stored profit management rules.

As stated, in some bonus benefit embodiments, wherein a customer has selected at least one first vending machine product, a general benefit offer may comprise an opportunity to purchase a second vending machine product at a discount during the same transaction. Such a general benefit offer may comprise one or more of, but is not limited to, (i) a dynamically-priced upsell or “round-up offer,” wherein the customer may purchase an additional product in exchange for an amount of change due (typically less than the product’s retail price) as the result of selecting at least one first product, and/or (ii) a fixed-price upsell or “promotional price” that enables the customer to purchase an additional product for a discount (e.g. at a price that is less than full price, but not necessarily correlated to the amount of change due to the customer as the result of a first selected product).

In some embodiments wherein a general benefit offer comprises a dynamically-priced upsell, one or more profit management rules may be constructed in accordance with general product data and/or benefit acceptance data so as to determine one or more particular general benefit offers. The following hypothetical depiction of “dynamically-priced upsell rules database” demonstrates several exemplary rules for such embodiments:

DYNAMICALLY-PRICED UPSELL RULES DATABASE

To increase expected profitability, offer a dynamically-priced upsell to a customer wherein:	
1.	The corresponding product’s unit cost is \leq \$.15
2.	The corresponding product’s actual velocity is \leq .50 units/day
3.	The amount of change due $>$ the corresponding product’s unit cost
4.	The acceptance rate of the benefit offer (comprising corresponding product) is \geq 70%

In this manner, product data and/or benefit acceptance data may be analyzed in light of such stored dynamic upsell rules so as to determine one or more particular dynamically-

priced upsells to offer to a customer pursuant to an increase in expected profitability. For example, a rule similar to “Rule #1” may be executed so as to select a corresponding product (i.e. if a benefit offer is “Get a Snickers® bar instead of your change!”, Snickers® is the corresponding product) in a manner that reduces cost. “Rule #2” promotes the sale of corresponding products that are not selling well; “Rule #3” may guarantee that a dynamically-priced upsell is profitable; “Rule #4” may assure that a dynamically-priced upsell offer has a high likelihood of being accepted. It should be noted that any variations and/or combinations associated with these and other such rules are contemplated within the scope of the present invention.

In other embodiments, wherein a rule has determined that the status of a vending machine is such that a general benefit comprising an opportunity to purchase one or more items at a discount may be offered (e.g. during the same transaction in which a first item is purchased at a single product vending machine), a general benefit may comprise a fixed-price upsell or promotional price (i.e. a discounted price for one or more products, specific to a particular transaction). In such embodiments, one or more profit management rules may be utilized to determine one or more specific fixed-price upsells to be presented to a customer as a benefit offer. A “fixed-price upsell rules database” may contain such profit management rules; a hypothetical depiction of such a database follows:

FIXED-PRICE UPSELL RULES DATABASE

To increase expected profitability, offer a fixed-priced upsell to a customer wherein:	
1.	The corresponding product's unit cost is \leq \$.15
2.	The corresponding product's actual velocity is \leq .50 units/day
3.	The fixed price $>$ the corresponding product's unit cost
4.	The acceptance rate of the benefit offer (comprising corresponding product) is \geq 70%
5.	The fixed price $<$ the retail price

It may be noted that several rules referencing product data and/or benefit acceptance data (e.g. “Rule #1,” “Rule #2” and “Rule #4”) may be applicable to both dynamic- and fixed-price upsell determinations pursuant to the increase of expected profitability.

Contrastingly, certain rules (e.g. “Rule #3”) may be utilized so as to specifically assure the profitability of fixed-price upsell benefit offers. In this manner, a fixed-price upsell

may (i) enable a customer to purchase one or more vending machine products at less than full price, and (ii) be constructed in accordance with one or more profit management rules so as to increase the expected profitability of a vending machine.

In other bonus benefit embodiments (e.g. wherein a customer has selected at least one first vending machine product during a transaction of a single product vending machine), a general benefit offer may comprise an opportunity to purchase a second vending machine product at a discount during a later transaction (e.g. a benefit offer is a “\$.15 off Snickers® – Tuesday through Thursday” coupon). Accordingly, should the status of a machine (e.g. as determined by a profit management rule) be such that a benefit offer may comprise an opportunity to purchase one or more additional products at a discount during a later transaction, one or more profit management rules may be constructed in accordance with general product data and/or benefit acceptance data so as to determine a benefit offer that increases a vending machine’s expected profitability.

In such embodiments, a benefit offer may comprise a coupon provided via a vending machine output device, enabling a customer to redeem a discount during a later transaction. In some embodiments, a coupon may be tangible (e.g. paper is outputted via a printer). In other embodiments, a coupon may be intangible (e.g. rather than print a physical coupon, a vending machine display device outputs a code which a customer may input via a keypad during a later transaction). Accordingly, in some embodiments, a coupon may comprise a means for validation (e.g. a barcode, etc.), such that valid redemption requests (e.g. issued, non-duplicate codes) may be honored upon a customer’s return visit to one or more machines.

Accordingly, various profit management rules may be constructed in accordance with general product data and/or benefit acceptance data so as determine a coupon (e.g. general benefit offer), which may then be presented to a customer (e.g. in conjunction with a game-themed presentation) so as to increase a vending machine’s expected profitability. Such profit management rules may be stored in a “coupon rules database,” a hypothetical example of which follows:

COUPON RULES DATABASE

To increase expected profitability, offer a coupon to a customer wherein:	
1.	The corresponding product’s unit cost is \leq \$.15

2.	The corresponding product's actual velocity is \leq target velocity
3.	The coupon may only be redeemed 5:30 – 9 p.m.
4.	The acceptance rate of the benefit offer (coupon) is $\geq 70\%$
5.	The discount amount is \leq \$.15
6.	The corresponding product is Cheetos®
7.	The sale price $>$ unit cost

In this manner, a profit management rule may determine to offer a coupon such that (i) one or more specific products are promoted (e.g. a product with a low unit cost), (ii) customers may be driven to transact at vending machines during certain times (e.g. “off-peak” or “low-traffic” periods), (iii) the coupon has a high likelihood of being accepted (e.g. high acceptance rate), and/or (iv) expected profitability may be increased in any manner described herein.

It may be noted that any combination of rules may be used to determine a benefit offer comprising a coupon. For example, if a determined coupon is “\$.15 off your next Dentyne® purchase – Friday 5 p.m. to Monday 9 a.m.,” multiple profit management rules may have been utilized to construct the offer such that (i) the unit cost of the product is low, (ii) the product has been selling at a less-than-desirable velocity, (iii) the customer may be driven to transact during off-peak hours, (iv) the discount amount is relatively low, etc.

It may also be noted that in various bonus benefit embodiments, a profit management rule may indicate to offer an inventory group (e.g. of coupons for discounted products) from which at least one may be selected by a customer as detailed previously herein (see product entitlement embodiments).

In further embodiments wherein a benefit offer may comprise an opportunity to purchase one or more products at a discounted price, a general benefit may comprise a refund of at least one first-selected item. For example, if a customer (i) approaches a single product vending machine, (ii) inserts \$1.00 into a bill validator and (iii) selects Sprite® for \$.75, a game-themed presentation may occur in a manner such that (i) the result of the presentation is a general benefit offer comprising a refund (“Winner! \$.75 refund!”), (ii) the first-selected product is provided (a unit of Sprite® is dispensed) and (iii) payment for the first-selected product is returned to the customer (e.g. four quarters are provided via a change dispenser). Refunds for one or more particular first-selected

products may be determined based on profit management rules that consider machine status data and product data as described herein (e.g. in a manner substantially similar to embodiments involving the provision of free or discounted products).

In further bonus benefit embodiments, a general benefit may comprise a non-food product benefit. In some embodiments, a non-food product benefit may comprise a free product (and/or service, such as a pre-paid phone card) and/or an opportunity to purchase such a product at a discount (e.g. a product that is not sold by a vending machine during routine transactions). In some embodiments, a non-food product benefit may be determined and offered to every customer of a vending machine (e.g. at the conclusion of every transaction). In other embodiments, a non-food product benefit may be determined and offered in accordance with one or more machine status rules as described herein (e.g. if total machine profit in fill period exceeds a threshold, offer a non-food product benefit). Additionally, a vending machine control system may, in light of retrieved machine status data, non-food product data and/or at least one first selected product, determine to offer one or more non-food product benefits based on one or more stored rules, which may be stored in a “non-food product rules database.” An exemplary depiction of such a database follows:

NON-FOOD PRODUCT RULES DATABASE

To increase expected profitability, offer a non-food product to a customer wherein:	
1.	The non-food product has ≥ 20 units in stock
2.	The margin of first selected product is $\geq \$.20$
3.	The manufacturer of first selected product is Mars™
4.	The acceptance rate of the benefit offer (non-food product) is $\geq 70\%$

In this manner, one or more non-food product benefits may be determined and offered to vending machine customers in a manner such that expected profitability may increase (e.g. a third-party pays a vending machine operator a bounty for each non-food product distributed, customers receiving non-food products from vending machines return to those machines for future transactions, etc.).

In still further bonus benefit embodiments, a general benefit may comprise a subscription to one or more vending machines. Such a subscription may provide a customer with an opportunity to procure a certain number of products during a certain

time period (e.g. “One Diet Coke® per week during the month of June”). In some embodiments, a general benefit may comprise a free subscription. In other embodiments, a general benefit may comprise an opportunity to purchase a subscription at a discount (e.g. “Get 9 cans of Sprite® for \$5 – redeem by April 1”). It may be noted that since a subscription may effectively provide a customer with one or more free or discounted products, determinations for providing subscriptions may be made in a manner substantially similar to determining benefit offers comprising free or discounted products (discussed in previous bonus benefit embodiments). For example, a vending machine control system may (i) execute a stored machine status rule determining to offer a free product as part of a subscription, (ii) determine, in light of product data, benefit acceptance data and/or or more stored “subscription rules” to offer a discounted subscription (e.g. a subscription may be “4 bags of Doritos for \$2” if Doritos® have low unit cost and are not selling at a desired velocity).

Additionally, a determination to provide a subscription may consider at least one first-selected product. For example, if a customer selects a Snapple® Lemon Iced Tea during a transaction of a single product vending machine, a vending machine control system may determine to offer a subscription comprising Snapple® products. It should also be noted that a general benefit comprising a subscription may additionally comprise a means for redeeming the subscription during later transactions (as discussed in “coupon” embodiments). Subscription offers are described at length in Applicant’s U.S. Patent No. 6,298,972, entitled METHOD AND APPARATUS FOR ESTABLISHING AND MANAGING VENDING MACHINE SUBSCRIPTIONS, issued October 9, 2001; U.S. Patent No. 6,085,888, entitled METHOD AND APPARATUS FOR ESTABLISHING AND MANAGING VENDING MACHINE SUBSCRIPTIONS, issued July 11, 2000; and U.S. Patent No. 5,988,346, entitled METHOD AND APPARATUS FOR ESTABLISHING AND MANAGING VENDING MACHINE SUBSCRIPTIONS, issued November 23, 1999; the entirety of each is incorporated by reference herein for all purposes.

In still further bonus benefit embodiments, a general benefit offer may comprise an entry to a contest or sweepstakes (e.g. “Winner! You’ve been entered in a drawing for a Ford Explorer!”). In some embodiments, machine status data and associated rules may

determine whether or not to present a sweepstakes or contest entry as a general benefit offer to one or more vending machine customers. In some embodiments, winners of such a sweepstakes may be entitled to receive one or more vending machine products (e.g. a contest winner gets one of each product of a vending machine); such products may be determined as discussed previously (e.g. bonus product embodiments). In other embodiments, winners may receive non-food products (e.g. a contest winner receives an Apple iPod®); such non-food product benefits may be determined as discussed previously (i.e. non-food product embodiments). For example, applicant's co-pending patent application, entitled SYSTEM FOR VENDING PHYSICAL AND INFORMATION ITEMS, Serial No. 09/713001, filed November 17, 2000, discusses the vending of music files.

Further, in some embodiments, a vending machine control system may determine to offer a sweepstakes or contest entry to a limited number of vending machine customers (e.g. only 1,000 entries will be allowed). In other embodiments, every customer of a vending machine may be presented with a benefit offer comprising a sweepstakes or contest entry. In still further embodiments, a customer may only be provided with a benefit offer comprising a sweepstakes or contest entry if various customer data is provided, as discussed further herein (e.g. customers provide an e-mail address via a vending machine input device so that winners may be notified upon the completion of a sweepstakes or contest drawing).

In yet further bonus benefit embodiments, a general benefit offer may comprise an opportunity to receive additional benefit offers (e.g. a benefit offer is a free spin of an animated prize wheel game-themed presentation). Such benefit offers may be determined (i) based on machine status data (e.g. if a machine has met a profit goal, a general benefit may comprise a free spin), (ii) based on at least one first selected product (e.g. if the margin of at least one first selected product is larger than a predetermined threshold, a general benefit offer may comprise a free spin), (iii) randomly (e.g. a vending machine control system receives a signal from a random number generator indicating to present a free spin to a customer), and/or (iv) in a any other manner.

It should be noted that various other types of benefit offers are contemplated within the scope of the present invention, so long as such benefit offers may increase

expected profitability by (i) increasing the profit margin of vending machine transactions (e.g. by selling items with lower unit costs and/or higher retail prices), (ii) increasing the actual velocity of items sold (e.g. in some embodiments, profit management rules may indicate that expected profitability increases if products are sold at a lesser profit margin, but with a sufficiently offsetting increase in volume), (iii) establishing, increasing, or promoting the overall customer loyalty and/or goodwill associated with one or more machines (e.g. customers who receive benefits may perceive machines to be valuable and/or entertaining, and therefore may return to machines for future transactions), and/or (iv) any other method described herein. Additionally, any combination of benefit offers may be determined and presented in any manner described herein (e.g. a benefit offer may comprise a dynamically-priced upsell as well as an opportunity to receive additional benefit offers: “Take any green item instead of your change – AND spin again!”).

Additionally, in some embodiments wherein a general benefit may comprise a product benefit and/or an opportunity to purchase a product at a discount, one or more restriction rules may be utilized in determining whether or not a particular general benefit may be offered. As discussed in relation to product entitlement embodiments, a restriction rule may determine that a certain product benefit may or may not be offered depending on at least one first selected product. For example, during a transaction of a single product vending machine, if a customer chooses a bag of chips as a first selected product, a restriction rule may dictate that a product benefit comprising a pack of gum may not be offered to the customer.

In this manner, general product data, machine status data, benefit acceptance data and/or non-food product data may be analyzed in accordance with various profit management rules so as to determine a general benefit offer to be presented to a customer as the result of a game-themed presentation.

STEP 400: OUTPUT A GAME-THEMED PRESENTATION INDICATING A DETERMINED BENEFIT

In some bonus benefit embodiments, once a general benefit offer is determined, it may be indicated to a vending machine customer as the result of a game-themed presentation.

In some embodiments, a game-themed presentation may be outputted to a customer via one or more vending machine output devices as previously described. For example, a presentation may comprise a game-themed animation depicted on an LCD display with accompanying sound effects emitted via audio speakers. Additionally, in some embodiments, a game-themed presentation may incorporate various other types of machine hardware (e.g. LED price displays) as detailed further herein.

In various product entitlement embodiments wherein a general benefit offer has been determined, game-themed presentations may comprise one or more of several different themes so as to indicate a determined benefit offer as the result of such a presentation (for illustrated representations of some potential bonus benefit game results, see Figure 5). Several examples of such themes have been previously discussed (see product entitlement embodiments). As stated, it may be appreciated that any means of communicating a determined benefit offer as the result of a game-themed presentation are contemplated within the scope of the present invention, such means including but not limited to (i) text and/or numerals, (ii) audio, (iii) graphics, photographs or other icons, and/or (iv) any combination thereof.

Additionally, in some embodiments wherein a general benefit offer comprises an opportunity to receive additional benefit offers (e.g. a free spin of a prize-wheel game), more than one game-themed presentation may be outputted to a customer (e.g. an animated prize wheel spins, lands on “Spin Again!”, animates once more, and lands on “Take a pack of Dentyne® instead of your change!”). In some embodiments, after viewing a first game-themed presentation, further input may be required from a customer before a second game-themed presentation is outputted (e.g. a customer must press a “Spin Again!” button of an input/output device). In other embodiments, a second game-themed presentation may be outputted automatically (e.g. upon the conclusion of a first game-themed presentation, a prize wheel automatically animates once again).

STEP 500: PROVIDE AT LEAST ONE BENEFIT

In some embodiments, once a determined general benefit has been indicated to a player as the result of a game-themed presentation, the benefit may be provided in a manner such that no further input or action is required from a customer. For example, in

an embodiment wherein a determined general benefit comprises a free product (e.g. a prize wheel spins and lands on “Winner! Free Lays® Potato Chips!”), the benefit may be provided in a substantially automatic manner (e.g. one or more vending machine dispensing mechanisms may then receive a signal from a control system, and actuate so as to dispense the bag of chips, without requiring any further commands or instructions from a customer).

In other embodiments, a determined benefit may only be provided after receiving further input from a customer (e.g. via one or more input or input/output devices described herein). For example, in an embodiment wherein a determined general benefit comprises an opportunity to purchase one or more discounted vending machine products during a first transaction, (e.g. a benefit offer comprises a dynamically-priced upsell offer: “Take a Snickers® bar instead of your change!”), a further selection, decision, command and/or instruction may be required from a customer before the benefit is provided (e.g. a customer selects an “OK – Give me the Snickers® Bar!” button displayed on a touch screen input/output device, the candy is dispensed, and the customer’s change is routed internally to a machine coin storage device rather than to a change dispenser). Further, input regarding a selection of at least one product from at least one inventory group (e.g. “Take any blinking green item instead of your change!”) may be required and received in any manner as discussed previously. Contrastingly, in some bonus benefit embodiments wherein a game-themed presentation concludes in the presentation of a general benefit offer, a vending machine customer may provide further input so as to reject a benefit offer (e.g. a customer presses a “No thanks – Just give me my change!” button).

In some bonus benefit embodiments, a general benefit comprising a vending machine product (e.g. provided for free or at a discount) may be dispensed via a product delivery system (e.g. a delivery bin or chute) in accordance with any distribution functions or dispensing mechanisms (e.g. dual helices) described herein and/or known in the art.

As stated, in other bonus benefit embodiments, a general benefit may comprise an opportunity to purchase one or more vending machine products at a discount during a later transaction (e.g. a benefit offer comprises a coupon printed via a vending machine

output device). In such embodiments, before a corresponding product is provided for a discounted price, it may be necessary to validate a requested discount. Several methods for validating discounts (e.g. coupons) are contemplated herein. For example, a vending machine control system may first receive a "coupon identifier," such means including but not limited to (i) scanning a barcode of a physical coupon, (ii) receiving a numeric "coupon code" via an input device (e.g. external vending machine keypad), and/or (iii) receiving encoded information via a plastic card with a magnetic strip, etc. A vending machine control system may then (i) access a "coupon database" to determine if the identifier is valid (e.g. the code has been outputted but not yet redeemed), and if so (ii) make a record in the coupon database reflecting the redemption of the coupon, and/or (iii) enable that one or more corresponding products be purchased at a discount (e.g. for one transaction, the price of a corresponding product is reduced by a discount amount from full price to a sale price, a credit balance is increased by a discount amount, etc.).

Further, in an embodiment wherein a general benefit comprises a subscription, a corresponding product may only be provided if a customer's request to receive the product is valid (e.g. the customer has not redeemed every unit of Diet Coke® to which he was entitled as per his subscription, the specific product requested by the customer is valid in light of the terms of the subscription, etc.). As stated, subscription offers are described at length in Applicant's U.S. Patent No. 6,298,972, entitled METHOD AND APPARATUS FOR ESTABLISHING AND MANAGING VENDING MACHINE SUBSCRIPTIONS, issued October 9, 2001; U.S. Patent No. 6,085,888, entitled METHOD AND APPARATUS FOR ESTABLISHING AND MANAGING VENDING MACHINE SUBSCRIPTIONS, issued July 11, 2000; and U.S. Patent No. 5,988,346, entitled METHOD AND APPARATUS FOR ESTABLISHING AND MANAGING VENDING MACHINE SUBSCRIPTIONS, issued November 23, 1999; the entirety of each is incorporated by reference herein for all purposes.

Still further, in an embodiment where a general benefit offer comprises a refund of at least one first selected product, the refund may be provided in any necessary manner such that the purchase amount of a first selected product (e.g. \$.65) may be returned to the customer (e.g. an inputted bill is returned via a bill validator, change is output via a change dispenser, etc.).

Still further, in embodiments wherein general benefit offers comprise non-food products or services, such general benefits may be provided by any appropriate means. Methods of providing non-food product benefits may include, but are not limited to (i) a physical product (e.g. a phone card) is dispensed via a vending machine distribution function, (ii) a discount redeemable for a non-food product (e.g. a “10% off at The Gap” coupon with an accompanying redemption code) is provided via an output device (e.g. a printer), (iii) customer data is collected such that a free or discounted non-food product may be provided at a later time (e.g. in network embodiments, a customer fills in his contact information via a vending machine input device connected to a third-party Web site), and/or (iv) any other practical means.

In this manner, in light of profit management rules, restriction rules and various data, a general benefit offer may be indicated to a vending machine customer as the result of a game-themed presentation, and provided to the customer. It should be noted that any processes, determinations, concepts and/or rules disclosed with respect to bonus benefit embodiments may be applicable to any or all other embodiments and processes disclosed elsewhere herein.

ALTERNATE EMBODIMENTS

- In some embodiments, a sensory device may be utilized to detect one or more external vending machine conditions, which may comprise (i) the length (e.g. measured in seconds) of one or more vending machine transactions, and/or (ii) the approximate number of customers waiting (e.g. in a line) to transact with a vending machine. For example, a sensor may comprise a motion, weight and/or infrared sensor equipped so as to detect the presence of a person in proximity to one or more vending machines (e.g. a customer standing substantially close to the front of a vending machine cabinet is detected by a vending machine sensory device). In various embodiments, such sensory devices may be utilized in communication with a vending machine control system so as to alter a game-themed presentation (or characteristic thereof) in light of external vending machine conditions. For example, a vending machine sensory device may detect the formation of a long line at a vending machine, and thus (i) decrease the length of one or more game-themed presentations (e.g. rather than take five seconds to resolve, a prize wheel animation concludes immediately), (ii) eliminate the chance that a game result comprises a “free spin,” and/or (iii) reveal a benefit offer without first outputting a game-themed presentation. In this manner, a vending machine of the present invention may be equipped to output game-themed presentations in a manner such that external vending machine “traffic conditions” are considered, thereby reducing the likelihood that prospective customers are discouraged from transacting with the vending machine (e.g. customers are not forced to wait in long lines as game-themed presentations are not substantially lengthy). Various methods for detecting and marketing to prospective vending machine customers are described at length in Applicant’s U.S. Patent No. 6,324,520, entitled METHOD AND APPARATUS FOR COLLECTING AND APPLYING VENDING MACHINE DEMAND INFORMATION, issued October 1, 1998, the entirety of which is incorporated by reference herein for all purposes.
 - In another embodiment, an internal vending machine timer may be utilized to measure the time elapsed (e.g. in seconds) during one or more vending machine transactions. For example, an input device and/or sensory device may

receive a signal indicating the “beginning” of a transaction (e.g. a customer inserts a dollar into a bill validator). Upon the receipt of such a signal, a vending machine processor may instruct a vending machine timer to begin measuring the time elapsed during the transaction. In some embodiments, should the length of a transaction meet or exceed a predefined threshold of time (e.g. 30 seconds or more), a vending machine may alter a game-themed presentation or result thereof (e.g. by outputting a shorter presentation, determining to offer a particular benefit as opposed to an inventory group, etc.). It may be noted that the “beginning” and “end” of a transaction may be represented by various events (e.g. a transaction begins when a weight sensor detects a customer in front of a machine, and ends when the weight sensor no longer detects the customer; a transaction begins upon the receipt of payment and ends upon the actuation of a dispensing mechanism, etc.). In this manner, a customer may not prevent further customers from transacting with a vending machine by unnecessarily lengthening a particular transaction (e.g. by taking too long to decide whether or not to accept a benefit offer, select a particular product from an inventory group, etc.).

- In some embodiments, should situations arise wherein sensor-detected “traffic” is light (e.g. few people walk past a vending machine), a profit management rule may indicate to output bonus benefits at a higher frequency (or benefits of greater perceived value), so as to entice more customers to transact with a vending machine. Additionally, it may be determined that such “low-traffic” periods are an ideal time for presenting “attraction sequences” via vending machine display devices (e.g. an LCD screen depicts a loop of a “sample” game-themed presentation so that it is viewable to passers-by).
- In some embodiments, a vending machine control system may output a game-themed presentation to a customer who has not selected or purchased a first product (e.g. a first component product of a package deal or a first selected product of a single product vending machine). Such a game-themed presentation may indicate a determined benefit offer. For example, a vending machine control system may determine, in light of machine status data, general product data, benefit acceptance

data and/or corresponding stored rules, to offer a free or discounted product (as detailed previously). Accordingly, a machine may (i) continually output game-themed presentations to prospective vending machine customers (e.g. when idle or not engaged in a transaction, a vending machine outputs game-themed presentations as “attraction sequences”), and/or (ii) output game-themed presentations upon the detection of one or more prospective customers (e.g. one or more sensory devices detects a favorable “traffic condition” or person in proximity to a machine).

- In some embodiments, a vending machine may output instructions to customers (e.g. via a display device) for obtaining a chance to receive benefits without first purchasing one or more vending machine products (e.g. a free spin of a prize wheel game). For example, a customer may be instructed to send a self-addressed, stamped envelope to a particular address requesting a free spin. In such an example, a physical game piece indicating a “game entry code” may then be sent to the customer, such that a customer may enter the code (e.g. via an external vending machine keypad) and receive a game result without first purchasing a vending machine product.
- In some product entitlement embodiments, wherein a customer may be entitled to receive a first component product and at least one additional component product of a 2-for-\$1 package deal, a vending machine control system may output a game-themed presentation indicating (i) a specific first component product and a specific additional component product, and/or (ii) one or more inventory groups from which all component products may be selected. Such game results (i.e. product benefits) may be determined based on product data and profit management rules as detailed herein. In this manner, all component products of a package deal may be determined and presented to customers as the result of game-themed presentations as detailed herein.
- In some embodiments, a game-themed presentation may incorporate various machine hardware or devices, including but not limited to (i) colored “product LEDs” corresponding to each row position of a vending machine (e.g. the shelf section underneath each product of a vending machine has both a green and a red LED corresponding to that particular product), (ii) digital price displays underneath each product of a vending machine (e.g. an LED price display underneath each product

displays a price for that product, e.g. \$.65), and/or (iii) any other hardware, such as dispensing mechanisms, keypads, delivery bin doors, etc.

- For example, a game-themed presentation may comprise a product LED “chasing sequence,” in which adjacent product LEDs may turn on and off sequentially (e.g. so as to create the illusion that LEDs are “chasing” each other), ultimately indicating a determined benefit as the game result (e.g. the sequence “stops” such that the LED under a particular product is lit). Such a game-themed presentation may additionally comprise a roulette theme (e.g. an LCD screen depicts an animated roulette wheel that spins while the product LEDs chase each other).
- A bingo-themed game presentation may also incorporate product LEDs. As detailed previously, a vending machine output device (e.g. LCD screen) may display a bingo-themed animation that may reveal one or more row positions corresponding to a determined product benefit (e.g. an animated bingo ball depicts “A-1”). Accordingly, product LEDs corresponding to such identified row positions may be actuated in accordance with the presentation (e.g. the green LED for row position A-1 is lit).
- A promotional price-themed game presentation may incorporate one or more digital pricing displays. For example, in an embodiment wherein a determined benefit is a transaction-specific discount for a particular product (e.g. a promotional price or fixed-price upsell), the digital pricing display, which may have previously been used to display the retail price (e.g. \$.65) of the corresponding product, may blink, light, animate and/or otherwise change so as to alert the customer to the new, discounted sale price (e.g. \$.50).
- Such embodiments incorporating various machine hardware may also be utilized in accordance with game-themed presentations indicating benefit offers comprising one or more inventory groups from which one or more products may be selected. For example, the result of a game-themed presentation may comprise a “green inventory group” from which one product may be selected (e.g. a green product LED underneath each product in the determined inventory group is actuated such that a customer may easily

discern all products belonging to the inventory group). Further, in an embodiment where a machine's products can be divided into two inventory groups – “red” and “green” – the green and red spaces of a roulette wheel may be used to represent such groups during game-themed presentations (e.g. if an animation depicts a ball landing on a green space, a customer may select a product from the green group). Inventory groups are discussed in detail in Applicant's co-pending U.S. Patent Application No. 60/491215 (Attorney Docket No. 03-045) entitled APPARATUS, SYSTEM AND METHOD FOR VENDING A COMBINATION OF PRODUCTS, filed July 30, 2003, which is incorporated by reference herein for all purposes.

- Additionally, various vending machine devices or hardware may be utilized for the purpose of receiving promotional codes, coupon codes and/or coupon identifiers discussed herein. For example, to activate a discount (e.g. provided as the result of a game-themed presentation during a previous transaction), a vending machine customer may input an alphanumeric code via an external vending machine keypad (e.g. “90A1B75”). Further, the first digit of such a code may be used to identify that a promotional code, and not a product selection, is being received (e.g. if a code is “90A1B75,” a vending machine processor may recognize that an input comprising the first digit “9” applies to receiving promotional codes and not product selections). U.S. Patent No. 5,924,078, entitled CONSUMER-PROVIDED PROMOTIONAL CODE ACTUABLE POINT-OF-SALE DISCOUNTING SYSTEM, discusses methods of accepting promotional codes from customers using a point-of-sale keypad, and is incorporated by reference herein for all purposes.
 - In some embodiments, various alphanumeric codes may be provided via one or more vending machine output devices (e.g. a code is printed on a coupon, displayed on an LCD screen, etc.). In other embodiments, a promotional code may be provided via various other machine hardware. For instance, in one embodiment, a promotional code may be output and received in the following manner: (i) a vending machine display device prompts a customer with the message, “To receive your discount, just remember the following sequence of products,” (ii) several product LEDs may then actuate in sequence (e.g. an

- LED underneath Twix® blinks, followed by Snickers® and finally Mounds®), (iii) the customer remembers and later returns to the vending machine to input the sequence (e.g. by selecting icons representing the products via an LCD input/output device, inputting the row position identifiers of the products via a keypad, etc.), and (iv) the corresponding benefit (e.g. free product) is provided to the customer.
- Additionally, in further embodiments, a game-themed presentation may result in the provision of a physical “game piece” to a vending machine customer. For example, a printer may output a paper “lottery ticket” or “bingo card” which a customer may use during a later transaction to potentially redeem one or more benefits. For instance, the customer may (i) return to a vending machine at a later time, (ii) input a “lottery ticket” (e.g. comprising a machine-readable barcode and human-readable “lottery numbers”), (iii) receive an indication of a determined benefit (e.g. an animation sequence portrays a lottery drawing and the result: “3 numbers correct! Take any green item at half price!”), and (iv) receive one or more determined benefits. In other embodiments, a game piece may require further action on behalf of a customer (e.g. a customer must first visit an operator-maintained Web site and input a code printed on the game piece before receiving a promotional code useable to redeem a benefit offer of one or more vending machines). In still further embodiments, a “scratch-off” game piece may comprise a description of a benefit offer and/or a redemption code that may not be visible to a customer until, for example, a latex-based material concealing such information is removed (e.g. the customer “scratches off” a concealed area with a coin).
 - In some embodiments, a vending machine customer may have the ability to influence the result of a game-themed presentation. For example, a customer may (i) command a spinning prize wheel to “stop” (e.g. by pressing a “Stop!” button of an LCD screen), (ii) choose to remove an object concealing a particular benefit offer when presented with more than one concealing object (e.g. when presented with “Door #1,” “Door #2” and “Door #3,” the customer selects “Door #2”), (iii) select specific lottery

numbers, a particular bingo card, etc., (iv) partake in any game of skill (e.g. answering trivia questions, selecting an appropriate icon after it has been “shuffled” via an animation sequence, remembering the location of concealed icons such as in a “memory” game, etc.), and/or (v) command, input, or interact with a vending machine game-themed presentation in any way so as to influence the game result. In some embodiments, in accordance with stored data and profit management rules as described herein, a vending machine control system may determine a unique pool of potential benefit offers relative to such “customer influence” embodiments before outputting a game-themed presentation (e.g. such that when a customer “stops” a prize wheel, a particular determined benefit offer may still increase expected profitability as all sections of the prize wheel represent benefit offers determined in such a manner).

- In other embodiments, a vending machine customer may be provided with the perception of influence over the result of a game-themed presentation, however the game result may be determined regardless of the customer’s input or actions. For example, a customer may command an animated, spinning prize wheel to “stop,” providing the customer with the illusion that they have influenced the result of the game-themed prize wheel presentation, however the result may have already been determined (e.g. “Pick any green item instead of your change!”).
- In one embodiment, a group of customers who live or work in proximity to one or more particular vending machines (e.g. residents of an apartment building, laborers in the same office complex, etc.) may work collaboratively toward a game result. For example, a vending machine LCD touch-screen may output a crossword puzzle game, wherein each customer may have an opportunity to enter a word. If the puzzle is solved completely before a certain deadline, each customer (or, e.g., resident) may be entitled to a discount or other benefit. Further, a particular customer might work cumulatively (e.g. tracked over the course of several vending machine transactions) toward solving a puzzle or achieving a certain game result.

- In some embodiments wherein customers influence game results through player skill, “high scores” or other player achievements may be output via a vending machine display device. In this manner, customers may enjoy the psychological benefit of their name or initials being displayed in association with a particular game achievement.
- In some embodiments, a benefit may comprise an increase in a vending machine customer’s credit balance. For example, if a customer approaches a single product vending machine and inputs payment of \$.55, a game-themed presentation may indicate a balance increase before a first product is selected (e.g. “Winner! \$.10 toward your purchase!”), such that a customer may purchase a more expensive item than planned. Such balance increases may be determined in any manner detailed herein referencing stored data (e.g. machine status data) and associated profit management rules. In some embodiments, a customer may only use a balance increase in purchasing one or more vending machine products (e.g. during a specific transaction, else the balance increase is forfeited). In other embodiments, a customer may “cash out” such a balance increase (e.g. no purchase is required). In further embodiments, balance increases may only be redeemed for certain products (e.g. those determined by stored profit management rules referencing product data).
 - Further, in some embodiments, a benefit offer may comprise an opportunity for a customer to increase his balance by inputting currency (e.g. coins) of a particular denomination (e.g. as the result of a game-themed presentation, a customer may be presented with a benefit offer stating, “Double your money! Every dime you insert is worth \$.20!”). As stated, in some embodiments, such balance increases may only be redeemed for certain products (e.g. those determined by stored profit management rules referencing product data). Additionally, in other embodiments, the particular denomination of currency (e.g. dimes) may be determined by one or more rules referencing machine status data (e.g. a particular vending machine maintains an unacceptably low number of dimes in inventory; thus, a machine’s inventory of dimes may increase as customers are motivated to input more of such a denomination than they otherwise would have).

- In a still further embodiment, a customer may be provided with a benefit for depositing a certain amount of currency. For example, a customer may be provided with a benefit if a machine's credit balance is more than \$20.00.
- In some embodiments, a benefit offer determination may consider "customer data," which may be recorded, stored and/or updated in a "customer database" in any manner detailed herein. For example, each customer of a vending machine may (i) partake in a registration process (e.g. performed at a vending machine or at an operator-maintained Web site), (ii) be assigned a unique alphanumeric customer identifier (e.g. "1285732"), (iii) be provided with a means for indicating the customer identifier to a vending machine (e.g. a customer may key in an alphanumeric code via an external vending machine keypad, swipe a plastic "customer card" comprising a magnetic stripe encoding the customer identifier, etc.), (iv) indicate the customer identifier before a particular vending machine transaction, and (v) be presented with various benefit offers based on the received identifier, customer data and stored "customer rules." Customer data may describe various purchase behavior associated with one or more particular customer identifiers. For example, a customer rule may indicate that if a customer has purchased fewer than two items during the current fill period, a determined benefit offer should comprise a dynamically-priced upsell. In another example, a customer rule may indicate that if a customer has purchased more than one Diet Coke® during the current week, a determined benefit offer should comprise a coupon for Diet Pepsi®. In this manner, individual customers of a vending machine may be marketed to in a manner such that determined benefit offers may (i) more accurately reflect customer tastes, and thus (ii) have a higher probability of being accepted, thereby having a positive effect on expected profitability.
- In some embodiments, after being presented with a benefit offer, a vending machine customer must first meet one or more further requirements before a benefit is provided. For example, in an embodiment wherein a benefit offer states, "Free Snickers® bar! Just enter your e-mail address!", a customer must first provide his e-mail address (e.g. via a vending machine keypad, operator-maintained Web site, etc.) before being provided with a Snickers® bar (i.e. product benefit). In another embodiment, a customer must first purchase a certain amount of products from one or

more vending machines before a benefit is provided (e.g. “Buy nine sodas, get the tenth free!”).

- In some embodiments, game-themed presentations and the results thereof may be output via a display screen of a user device, such as a personal computer, PDA, cellular phone or the like. For example, a customer may use a personal computer to access a Web site maintained by a vending machine operator, elect to play a game and be presented with a benefit offer (e.g. as the result of an interactive game or game-themed presentation). In such embodiments, a benefit offer may comprise not only a description of the benefit, but also (i) a redemption code that must be keyed in to receive the benefit (e.g. 9-12345), and/or (ii) an identification of at least one particular vending machine at which the benefit must be redeemed (e.g. “The machine in the lobby of 5 High Ridge Park, Stamford, CT, 06905”).
- In some embodiments, a customer may signal via an input device to begin a game-themed presentation. Exemplary input devices of such embodiments include, but are not limited to buttons, keys, levers, biometric inputs and the like.
- In some embodiments, various other output devices (e.g. flashing lights, spotlights, audio speakers, bells, whistles, etc.) may be actuated upon the output a one or more particular game results. In this manner, the excitement a customer may experience by winning a benefit may be enhanced (e.g. as lights flash and audio speakers emit an emphatic “Winner!” voice recording).

SPIRIT AND SCOPE OF THE INVENTION

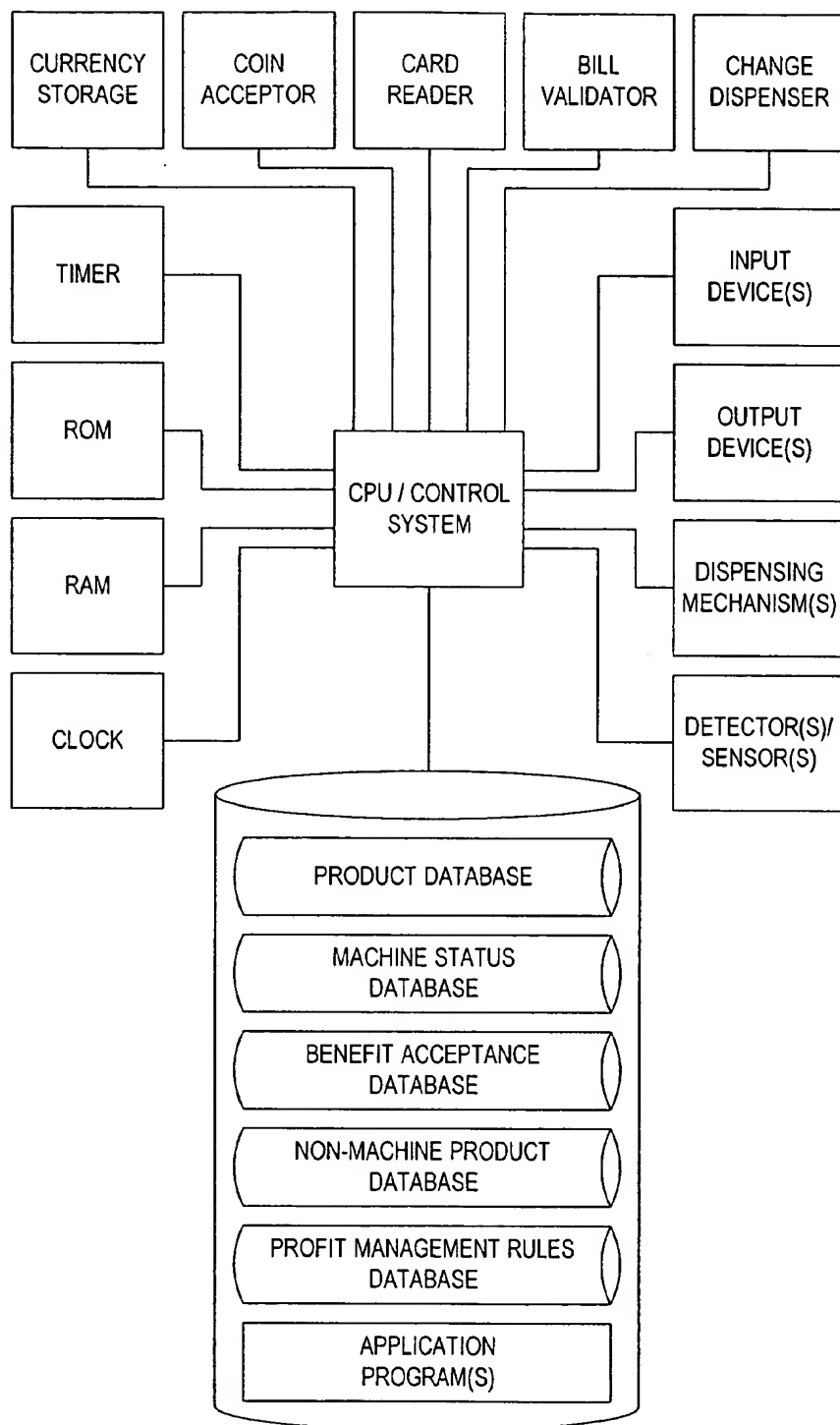
It should be noted that the embodiments described with reference to the following figures are presented for illustrative purposes only and are not meant to be limiting in any sense. It should also be noted that, as used herein, the terms “an embodiment”, “embodiment”, “embodiments”, “the embodiment”, “the embodiments”, “one or more embodiments”, “some embodiments”, “other embodiments,” “various embodiments” and “one embodiment” mean “one or more embodiments” unless expressly specified otherwise. Further, although particular features of the present invention may be described with reference to one or more particular embodiments or figures, it should be understood that such features are not limited to usage in the one or more particular embodiments or figures with reference to which they are described.

Further, it should be noted that although process steps, method steps, algorithms or the like may be described in a sequential order, such processes, methods and algorithms may be configured to work in alternate orders. In other words, any sequence or order of steps that may be described does not necessarily indicate a requirement that the steps be performed in that order.

In conclusion, while the methods and apparatus of the present invention have been described in terms of particular embodiments, those skilled in the art will recognize that the present invention may be practiced with modification and alteration without departing from the teachings disclosed herein.

POINTS OF FOCUS

- retrieving vending machine product data from a database,
 - determining at least one benefit to be offered based on the retrieved data,
 - outputting a game-themed presentation indicating a determined benefit, and
 - providing at least one benefit.
-
- receiving a customer selection of a vending machine product,
 - updating product data to reflect the selected product,
 - retrieving accessed product data from a database,
 - determining whether to offer at least one benefit based on the retrieved data,
 - outputting a game-themed presentation indicating the determined benefit, and
 - providing at least one benefit.



SYSTEM OVERVIEW

FIG. 1

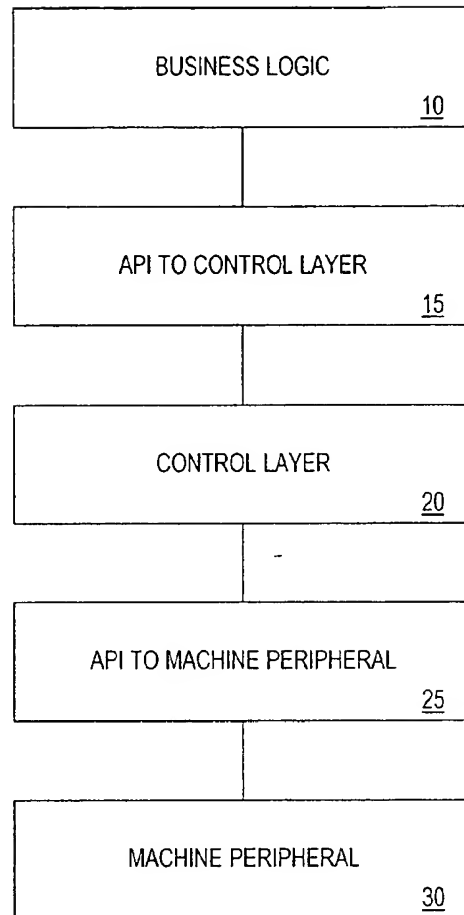
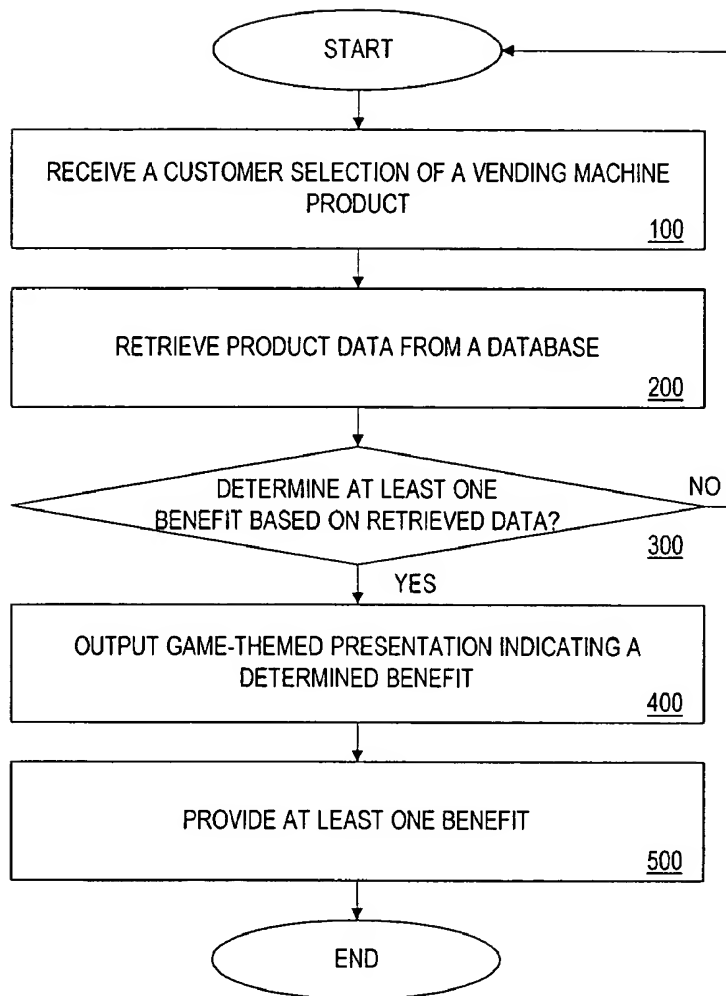


FIG. 2



PROCESS
STEPS

FIG. 3

Select ANY GREEN ITEM
Select ANY RED ITEM
Snickers
Select ANY BAG OF CHIPS
Twix
Select ANY RED ITEM and SPIN AGAIN!
Select ANY GREEN ITEM and Wrigley's Gum
Select ANY RED ITEM plus \$.50 OFF NEXT PURCHASE
WINNER! Select ANY ITEM!
WINNER! Select ANY ITEM plus \$1.00 REFUND!

POTENTIAL "PRODUCT
ENTITLEMENT" GAME
RESULTS

FIG. 4

WINNER! Take any GREEN ITEM
Take any RED ITEM instead of your change
WINNER! FREE Wrigley's Gum
SORRY, PLAY AGAIN
TAKE ANY ADDITIONAL ITEM Just add \$.25
WINNER! \$.65 Refund
FREE 15-minute Phone Card
WINNER! 1 FREE snack a week for 1 month
SPIN AGAIN!
\$.50 OFF NEXT PURCHASE 10 a.m. - Noon

POTENTIAL "BONUS
BENEFIT" GAME
RESULTS

FIG. 5